

4(60) `2017

ISSN 1813 1905

ЯКУТСКИЙ МЕДИЦИНСКИЙ ЖУРНАЛ



YAKUT MEDICAL JOURNAL

SCIENTIFIC - PRACTICAL JOURNAL
OF THE YAKUT SCIENCE CENTRE
OF COMPLEX MEDICAL PROBLEMS

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ISSN 1813 1905
4(60) '2017



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MEDICAL PROBLEMS

Quarterly

Registered by the Office of the Federal Service on
supervision in the field of communications, information
technologies and mass communications in the Republic
Sakha (Yakutia) December 13/2016

Registration number PI No.TU 14-00475

Subscription index: 78781
Free price

"Yakut Medical Journal" is included in the approved by
the Higher Attestation Commission of the Russian
Federation List of leading peer-reviewed scientific
journals and publications, in which the main scientific
results of dissertations for the acquisition of scientific
degrees of Doctor and Candidate of science on
biological sciences and medicine should be published.

The journal is included in the international directory
system under periodic and proceeding editions "Ulrich's
International Periodicals Directory"

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MATERIALS OF THE SCIENTIFIC-PRACTICAL CONFERENCE DEDICATED TO THE 50TH ANNIVERSARY OF THE CHILDREN'S SURGICAL SERVICE IN YAKUTIA

V.A. Savvina

PEDIATRIC SURGERY OF YAKUTIA - PAST, PRESENT, FUTURE

The Pediatric Surgical Service in Yakutia was established in 1967, at the same year on December 1 on the base of Pediatric Republican Hospital in Yakutsk the Department of Pediatric Surgery was opened, the stage of the development of pediatric surgery began. Now, after 50 years, it seems incredible that even in those far years when there was no modern surgical equipment, electrosurgical instruments, such voluminous operations as lobectomy, pericardotomy, etc. were carried out. Along with the development and becoming of pediatric surgery, pediatric anesthesiology and resuscitation also developed, which made it possible to perform more complex surgical interventions and care for serious patients. The department of pediatric surgery worked for 40 beds, there were 2 posts - purulent and clean surgery. Honored Doctor of the Republic E.N. Ponomarev was in charge of the department. Most of the patients were children with septic pathology: acute and chronic osteomyelitis, destructive pneumonia with very serious complications, diffuse peritonitis. There were no pediatric surgeons in the regions of the Republic; surgeons of the department flew to complicated cases. On 40 beds they managed to render planned surgical help. Evgeny Nikolayevich was a highly qualified surgeon who possessed the technique of many complex interventions, but his favorite section was pediatric urology. Sobolevsky V.F. worked as a senior resident in the department, who was more specialized in thoracic surgery. Viktor Feliksovich, along with c.m.s. assistant professor Gorodov Y.N. for the first time in Yakutia performed lobectomies, pericardotomies, surgeries for complications of destructive pneumonia, as well as for bronchiectasis. Sobolevsky V.F. for the first time in the republic performed thoracoplasty at pectus excavatum by Paltia. At that time, the operation was accompanied by a great deal of blood loss, requiring prolonged analgesia in the postoperative period. I remembered the words of Viktor Feliksovich: «Thoracic surgery is

a surgery on the vessels», since each vascular branch was tied up, at that time there was no electrocoagulant. In addition, Viktor Feliksovich is the ancestor of pediatric cardiosurgery, in 1992 he first performed a ligation of the common arterial duct with thoracic access, performed pericardectomy with constrictive pericarditis. Nikolaev Valentin Nikolayevich, who specialized in neonatal surgery, worked in the department. It should be noted that the mortality of newborns at that time was very high, which depended primarily on the problems of anesthesia and nursing children of this age after surgery. There was a general ward of intensive therapy with 40 beds, where were large children and newborns, including septic patients. Kapitonov Andrei Andreevich was involved in osteomyelitis in children, so 5-6 children with osteomyelitis were constantly treated there; many patients were there with advanced and chronic septic forms. The chronic form of osteomyelitis occurred in the 1990's in 30-35% of cases, which indicates a late diagnosis of the disease. Despite the high percentage of septic patients, mortality in acute hematogenous osteomyelitis was no more than 2% of cases. All this was achieved thanks to the creative productive work of the collective of the surgical department of the PRH. Eduard Ivanovich Petukhov was closely engaged in problems of acute hematogenous osteomyelitis and nowadays he continues to treat actively this pathology. Kapitonov A.A. and Petukhov E.I. for the first time applied the method of imposition of intraosseous lavage by K.S. Ormantaev, which saved many children's lives. Although the method at first glance is traumatic, washing the bone marrow of the tubular bone, but it allowed in a fairly short time to reduce the manifestation of infectious-toxic shock. Many implementations were applied by surgeons together with the pediatric traumatologist-orthopedist Solodovnikov P. N. for the treatment of the consequences of chronic osteomyelitis. Petr Nikolaevich truly is the founder of

pediatric orthopedics in the republic, he introduced methods of corrective osteotomies in congenital deformities, methods of surgical treatment of congenital clubfoot, including machine osteosynthesis, treatment of bone cysts with the use of allografts. Zuev Alexey Leonidovich, who is still a regular airborne surgeon, has been and continues to work with emergency surgery with visiting work. Vasiliev Evgeniy Pavlovich is the first pediatric urologist, he has introduced reconstructive operations with congenital hydronephrosis, ureterohydronephrosis, surgical treatment of hypospadias, various methods of operative treatment of varicocele, including microsurgery. The introduction of endoscopic surgery in the 1990s is associated with the name of Mikhail Vladimirovich Stroikov, who defended the thesis for the degree of candidate of medical sciences on the materials of the department in 2004. The first pediatric surgeon, who received the certificate of urologist-andrologist, was Nina Fedorovna Stepaniuc. Her name is associated with the introduction of endosurgery in pediatric urology, new methods of treating hypospadias, bladder pathology. Since 1987 I have been working in the surgical department of the PRH, I chose neonatal surgery, reconstructive surgery for congenital malformations. Over the years, many new algorithms and surgical methods were introduced. In 2003 I defended in the RSMU thesis for the degree of candidate of medical sciences, based on practical work, in 2014 - the doctor of medical sciences. Since 1994, the foundations of pediatric coloproctology have been laid, when the operations by Soave in Hirschsprung's disease, posterior sagittal anorectoplasty (Nikolaev V.N., Savvina V.A.) were introduced, patients with anorectal anomalies already began to be operated in the Pediatric Center. Nina Serafimovna Nemova, Ignatieva Marta Mikhailovna, Verbitskaya Lyudmila Ilyasovna, Berezin Semyon Maksimovich worked in the pediatric ENT department.

I want to recall our colleagues in intensive care - anesthesiologists: the

founder of the pediatric intensive care in PRH can be considered a remarkable, highly erudite doctor A.N. Ivanov. Later Kirillov Viktor Fedorovich headed IC. Anatoly Nikolaevich is also the founder of the pediatric endoscopic service, he performed bronchoscopy, search bronchial occlusions in bronchopleural fistulas in patients with destructive pneumonia. His pupil is a doctor of the highest category, pediatric endoscopist Illarionova Maria Pavlovna. Pediatric doctors reanimatologists Zhuravlev Reanoliy Anatolyevich, Zherbakov Sergey Nikolaevich, Popov Alexander Evgenievich and others made a huge contribution to the treatment of children with severe surgical pathology.

Thus, with rather meager technical capabilities, the lack of an intensive care unit for pediatric surgeons in the 1980-1990s, it was possible to reduce the mortality of children from surgical diseases, and to introduce more sophisticated surgical interventions.

The present of pediatric surgery began with the opening of the Center for Maternal and Child Health within RH №1- National Center of Medicine in March 1998, when specialized pediatric surgical departments were organized: thoraco-abdominal surgery, orthopedics and traumatology, purulent-septic department, pediatric neurosurgery, ENT department, and finally, pediatric intensive care and anesthesiology for 16 beds. I remember our move to the new building of the Center, how we were shocked by the scale of the areas, the equipment of the operating rooms, there were 2 halls with a full set of endovideosurgical racks. Of course, the present pediatric surgery is associated with the development of endosurgery in all areas of pediatric surgery, including neonatal surgery. Subsequently, in 2002, the department of thoraco-abdominal surgery was divided into a general surgical department and a department of pediatric urology. Department of Pediatric Neurosurgery was headed by an experienced neurosurgeon Prokopy Nikolaevich Semenov, ENT branch - Petrov Igor Filippovich. Now each department has its operating room. For 19 years the surgical service has been developing a lot. It is facilitated not only by the organization of the pediatric intensive care department, the technical equipment of the operating rooms, but also by the renewal of the creative team of like-minded people. The invaluable role of the education of the new generation of surgeons was made by the Department of Pediatric Surgery,

which was organized in 1997, headed by the Doctor of Medical Science, Professor Varfolomeev Ahmed Romanovich, who was the first director of the Center for Maternity and Childhood Protection. The staff of the department was c.m.s. associate professors A.A. Nikolaeva, P.N. Solodovnikov, L.A. Aprosimo, associate professor V.N. Nikolaev, A.P. Semenov, V.A. Savvina, in 2002 after the defense in Moscow c.m.s. M.E. Okhlopov came. Mikhail Egorovich since 2006 headed the surgical department of the Pediatric Center. Under his leadership, the department achieved great results: reconstructive operations on the esophagus, trachea, operations on the lungs, mediastinal organs, operations on the organs of the retroperitoneal space were introduced, pediatric oncology and neonatal surgery developed. In neonatal surgery, algorithms for treating developmental malformations and purulent-septic diseases of newborns have been changed, in 1998 with the opening of the Perinatal Center a department for the resuscitation of newborns was organized, and since 2011 the neonatal surgery beds have been opened on the basis of the surgical department. The process of laborious and productive work began in all areas of surgery for young children. The doctors of the surgical department actively published their results in various scientific journals, made reports at regional and Russian conferences and symposia. The development of endovideosurgery is primarily connected with the names of Okhlopov M. E., Tarasov A. Yu. In 2011, in the Pediatric Center, the North-Eastern Federal University equipped the operating room of the company Karl Storz, which allowed the introduction of high-tech surgical interventions, such as: thoracoscopic lobectomy, thoracoscopic surgery on the mediastinum, thoracoscopic esophagoanastomosis in newborns, thoracoscopic plastic defect in the diaphragm, including newborns, laparoscopic excision of choledochal cyst, laparoscopic reconstruction of biliary atresia, laparoscopic pyloromyotomy, laparoscopic removal of tumors thoracic, abdominal, and others.

A new, second generation of pediatric surgeons has appeared: c.m.s. Okhlopov Mikhail Egorovich, Tarasov Anton Yuryevich, Yakovlev Evgeniy Prokopevich, Erdyneev Tumen Erdyneyevich, Indeev Illarion Ivanovich, c.m.s. Pavlov Roman Nikolayevich, c.m.s. Vasilyev Sergey Petrovich, Popova Olga Oktyabrinnova, c.m.s.

Petrov Igor Filippovich, Shishigin Valeriy Antonovich, Dashkina Nadezhda Ramilievna, Korkina Natalia Petrovna, Mironova Lyubov Savvichna, Prokopyeva Valentina Vasilevna, Sleptsov Alexander Alexandrovich, Kupryakov Sergey Olegovich, Chernogradskaya Marfa Vladimirovna, Petrova Natalia Ermakovna, c.m.s. Kommunarov Vasily Valeryevich, Kharlampiev Afanasiy Afanasievich, Vychuzhina Lyubov Semenovna, Grigoryev Vasily Afanasievich, Gogolev Innokentiy Ivanovich, Khabarov Petr Petrovich. This generation of surgeons are engaged in the introduction of high-tech surgical interventions, and the second stage of development of pediatric surgery of the republic can be called as **the stage of introduction of high technologies in pediatric surgery**. Such areas of pediatric surgery as thoracic surgery, neonatal surgery, coloproctology, abdominal surgery, pediatric urology, traumatology and orthopedics, otorhinolaryngology, oral surgery, neurosurgery have developed.

During this period, laparoscopic interventions in planned and emergency surgery were introduced. 94% of appendectomy is performed endosurgically, laparoscopy is also introduced in the treatment of complicated appendicitis, with injuries of the abdominal cavity organs, with adhesive processes. The treatment protocols for many diseases and malformations have been changed, antenatal diagnostics of congenital anomalies and a perinatal consultation have been introduced, which allows predicting the development of severe complications in the newborn, which decides the timing, place and mode of delivery. That is the time has come when the fetus in the womb of the mother is already a patient of the pediatric surgeon. Mortality of newborns with surgical pathology decreased to 3%, in spite of the fact that premature babies were born, the criteria of live birth changed, and more necrotic enterocolitis changed. At present, we are already talking about the surgery of premature babies and the introduction of fetal operations. Single-stage reconstructive interventions for congenital malformations in the neonatal period were performed more often. Survival in multiple malformations also increased to 80%. With the improvement of nursing newborns in the specialized department of resuscitation of newborns, corrective interventions for occlusive hydrocephalus, with congenital heart disease in newborns began to be

performed. In 2016, there was another structural unit of pediatric surgery - the Department of Cardiovascular Surgery. Progress in pediatric urology is significant: modern one-stage methods of treating one of the most common malformations of the genitourinary system are introduced: hypospadias, good results in epispadias, laparoscopic pyeloplasty in hydronephrosis, retroperitoneoscopic surgeries, etc. With the extension of the age limit of patients in pediatric services, the gynecological pathology of adolescents, oncogynecologic diseases, which are also operated by a minimally invasive method, became more frequent. In pediatric coloproctology, the following operations have been introduced: endorectal reduction of the colon with congenital aganglionosis, laparoscopic access in the correction of anorectal anomalies, repeated surgical interventions in the case of insufficient retention function, levatorosphincteroplasty, surgical interventions are performed under the control of electromyography. Children with surgical pathology practically do not leave for special treatment outside the Republic, as all the main methods and modern modifications are performed within the walls of the National Center of Medicine.

In the ENT department in 2017, cochlear implantation was introduced, in plans development of high-tech auditory-improving interventions. Good functional and cosmetic results were achieved in the reconstruction of malformations of the maxillofacial area, which are among the most frequent anomalies in children. A variety of ophthalmic operations, including cataract treatment, laser coagulation of retinopathy of prematurity, is diverse. Pediatric neurosurgery has long gone beyond the emergency pathology, operations are performed in developmental malformations and tumors of the central nervous system in children.

Great progress is also being made in pediatric orthopedics and traumatology:

the doctors of the department are authors of the RF patents, rationalization proposals, the methods of treating congenital clubfoot are modified, the technique of osteosynthesis is improved, in terms of the introduction of surgical correction of scoliotic deformations of the spine.

During this period, the rates of pediatric surgeons in the polyclinics of Yakutsk, in major regional centers - the towns of Neryungri and Mirny are allocated. In Yakutsk polyclinic, the head of the pediatric surgery room have been for a long time Egor Egorovich Litvintsev, surgeon with a large experience of work, then Alexander Ilyich Monastirev. Now experienced surgeons Elena Vasilyevna Gusarevich, Innokenty Vasilievich Tsybandin work there. Ambulatory pediatric orthopedic service in Yakutsk is associated with the names of Petukhova Natalia Konstantinovna, Struchkova Ustinya Semyonovna, Lonin Stanislav Nikolaevich. In Neryungri, the pediatric surgical service was raised to the proper level by Anton Yurievich Tarasov, it is continued successfully by Peshkov Sergey Mikhailovich. It is very important that experienced surgeons work in large regional centers, since the variety of encountered pathology causes the surgeon to engage in diverse work which only a highly qualified specialist can adequately do. In Mirny, pediatric surgeons Shvetsova Marina Alfredovna, Abylkasymov Bakyt Toktobayevich have been working for more than 10 years. By the forces of the Department of Pediatric Surgery and the Chief Freelance pediatric Surgeon, certification cycles are periodically conducted, regional surgeons of the majority of central hospitals are trained, good continuity is established with district hospitals. Newborns with surgical pathology are evacuated in Republican Hospital №1, National Centre of Medicine, the therapeutic tactics of other patients of childhood are decided collectively by the specialists of the resuscitation consultative pediatric

center and the heads of profile surgical departments.

The third stage of development of pediatric surgery - **science and practice** will begin in 2017, after the half-century anniversary of our speciality. And the third generation of pediatric surgeons will take part in the continuation of the started work. Every year, a certificate of a specialist of a pediatric surgeon is received by 2 to 3 young doctors, filling in our friendly creative team. I would like to mention our young generation: Bozhedonov Konstantin Konstantinovich, Pavlov Ian Griyanovich, Belolyubskiy Afanasiy Afanasyevich, Ammosov Aleksandr Sergeyevich, Gotovtsev Nikolay Nikolaevich, Syrovatskaya Elena Fedorovna, Nikolaeva Anna Vladimirovna, Milev Vitaliy Viktorovich, Bochkareva Ekaterina Yurevna, Popova Elena Anatolyevna, Koryakina Anna Dmitrievna, Bosikov Vladimir Alekseevich, Kolmogorov Vladimir Vladimirovich, Alexeyev Vladislav Dmitrievich, Sofronova Maria Semenovna, Purpueva Lena Badmaevna (Mirny). This stage is not marked with only practice but also scientific researches, the introduction of new more sophisticated algorithms and approaches in pediatric surgery. Modern youth is striving for higher heights; many of the young doctors are postgraduates and aspirants.

The current level of development of the pediatric surgical service of the Republic gives us hope for the planned and growing development of our speciality. The future of pediatric surgery of republic is in safe hands!

The author

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K.K. Bozhedonov, V. A. Savvina, A.R. Varfolomeyev,
N.E. Petrova, A.Yu. Tarasov, V.N. Nikolaev

LAPAROSCOPIC CORRECTION OF THE COLEDOCHAL CYST IN CHILDREN

ABSTRACT

The article reflects the experience of treatment of children with congenital choledochal cyst from 2011 to 2016. The comparative analysis of surgical treatment by traditional and laparoscopic methods is presented. The comparative analysis of outcomes of operations showed advantages of the endosurgical method of treatment: minimal traumatism, smooth postoperative period, reduction of patient's days in hospital, saving dressing and medicines. In this regard the endosurgical method of treatment can be offered as operation of the choice in the surgical treatment of choledochal cysts.

Keywords: children, choledochal cyst, laparoscopic operations, complications.

INTRODUCTION

According to various authors, among all congenital malformations in children, the malformations of the bile-excreting ducts range from 6 to 8% [1-3]. The common bile duct cyst is a congenital dilatation, accompanied by signs of obstruction of the bile ducts. Treatment of this defect is exclusively surgical [2]. At present, total excision of the cyst with the formation of hepaticojejunostomy on the isolated Y-shaped bowel of the jejunum by Roux is the method of choice in the treatment of choledochal cysts. Excision of the cyst should be complete, as leaving the part of the cyst leads to complications (cholangitis, formation of stones, malignancy). Traditional access for this intervention remains a wide transverse laparotomy in the right hypochondrium. In 1995 for the first time G.A. Farello proposed a laparoscopic version of the operation [2]. The leading world clinics have accumulated a certain experience of minimally invasive interventions, which indicate that the number of postoperative complications is comparable to open operations [3].

MATERIALS AND METHODS OF RESEARCH

For the period from January 2011 to December 2016, 13 patients with cystic choledochal transformation were treated in the surgical department of the Pediatric Center. Laparoscopic correction was performed for 5 of them. The age of the patients at the time of surgery was 1.5 to 15 years. Seven patients were admitted urgently, five of them had cholangitis with an increase in bilirubin and abdominal pain, two patients with mechanical obstruction of the bile duct, intense icteritiousness of the skin and sclera, acholic stool and darkening of the urine. The remaining patients had no complaints.

The complex of preoperative examination included general clinical analyzes, abdominal echography,

fibrogastroduodenoscopy, radiopaque computer tomography of the abdominal cavity organs, according to indications magnetic resonance cholangiography, examination of specialists.

The complex of preoperative preparation included the following therapy: children with cholangitis, pancreatitis, increased bilirubin levels were prescribed antibacterial therapy, antiferment preparations, detoxification therapy, hepatoprotectors, diet therapy, until normalization of the analysis, parenteral nutrition for 1-2 days before the operation, cleansing enemas. The external puncture drainage of the bile ducts as the first stage was performed for 2 patients with phenomena of severe biliary hypertension.

The operative intervention in traditional operation was performed from a wide transverse laparotomy in the right hypochondrium. In the endosurgical method, all stages of the operation were performed with the help of 4 laparoports arranged «rhomboid». The initial stage was the opening of the lumen of the cyst and the evacuation of the contents, after which the mobilization of its walls was performed. The cyst was carefully mobilized from the surrounding tissues by a blunt and acute route (duodenum, pancreas, portal vein, hepatic artery). The distal end of the choledoch after excision of the cyst was sutured with nodal sutures. The technique of forming an isolated loop of the jejunum was performed according to the method of Roux. Formation of intercuspid anastomosis was carried out by manual continuous suture through a mini-laparotomic paraumbilic incision. We did not use the antireflux mechanism on the hinge loop, there is no need for the formation of an antireflux valve with a sufficiently long Roux loop (at least 40 cm) [2, 3]. After creating an isolated loop, its free blind end was held behind the transverse colon through the «hole» in the mesentery to the gates of the liver.

At 1-1.5 cm from the blind end of the anti-brazed edge of the loop, an enterotomy up to 10 mm was carried out, and hepatoconteroanastomosis was applied. The surgery was finished by draining the subhepatic space.

RESULTS AND DISCUSSION

Mortality and intraoperative complications were not noted. In the traditional method of treatment during surgery as a rule compensation of clotting factors was required. The average duration of the operation in the endosurgical method was 150-180 minutes, in open operation was 90-120 minutes. In the early postoperative period, children were in the department of anaesthesiology, reanimation and intensive care on average for 4-5 days. Children who underwent laparotomy needed prolonged epidural anesthesia for 48-72 hours and additional use of narcotic analgesics. Motor activity was restored faster in children who underwent endosurgical surgery (on average, 48-60 hours after surgery). Enteral load for them was possible in 3 postoperative days. 2 patients after traditional intervention in the early postoperative period had the inconsistency of hepatocoenteroanastomosis, which required re-operation. One patient had pancreatitis, which was docked conservatively. 1 patient had early adhesion of the intestinal obstruction in postoperative period, which required a second operation (laparotomy, viscerolysis). After laparoscopic intervention, 1 patient had a leakage of bile through the drain, which required relaparoscopy and the application of additional sealing seams to the anastomosis zone. The duration of hospitalization averaged 10-12 days after laparoscopic intervention versus 18-20 days after traditional open interventions.

The evaluation of the results of treatment in patients after laparoscopic hepatoenteroanastomosis showed

faster postoperative recovery, less severe pain syndrome, a good aesthetic result, significant savings in dressings and medicines.

CONCLUSION

Analyzing the work done, it should be said that the laparoscopic method of treatment is feasible and can be an operation of choice. The advantages of laparoscopy include a good visualization of the operating field, surgical accuracy, less severe pain syndrome in the postoperative period, rapid recovery of peristalsis, a good aesthetic result, a rapid recovery of patient activity, a reduction of hospital bed-days, a reduction of risk of adhesion in the abdominal cavity. It should be noted that this method requires the surgeon a lot of experience in performing endoscopic operations.

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THE EXPERIENCE OF LAPAROSCOPIC PYELOPLASTIES IN CHILDREN AND THE CHOICE OF THE METHOD OF DRAINAGE

ABSTRACT

The method of an open pyeloplasty until the end of the 20th century was considered as the «gold standard» of treatment of patients with hydronephrosis. However, rapid development of minimally invasive technologies hasn't avoided pediatric urology. Now the laparoscopy pyeloplasty is a widespread method of treatment. We have presented the experience of 22 laparoscopic pyeloplasties in children. The evaluation of the duration of operations, postoperative bed-days and complications were carried out. The analysis of methods of drainage was also carried out.

Keywords: laparoscopy, pyeloplasty, stent, pediatrics.

INTRODUCTION

Among obstructive uropathies, hydronephrosis is the most common pathology. In pediatric urological practice, the frequency of occurrence is 1:800 or 2.8 cases per 1000 newborns [1]. Stenosis of the pyeloureteral segment in hydronephrosis is one of the frequent indications for instrumental or surgical correction [3,4]. Nowadays the «gold standard» for correcting the patency of the ureteropelvic segment in children remains the dismembered plasty of the ureteropelvic segment (UPS), proposed by J. Anderson and W. Hynes in 1949 [2], which proved its reliability and a high percentage of good results (more than 90%) [5-10]. For a long time this operation was performed from

open access. Currently liuobotomous pyeloplasty fades into the background, both in adult and in pediatric urological practice. Since 1993, clinical cases of laparoscopic operations in adult patients have been described. In 1995, S. Peters and coauthors reported the first performed laparoscopic pyeloplasty (LP) in a child [11]. But pyeloplasty in children with laparoscopy remains a controversial issue because of the longer duration of the operation than with open pyeloplasty, the difficulty of imposing an intraocorporal suture, and the inexperience of the surgeons in the access performed [12]. Recent research has shown that this method can be an excellent alternative to open surgery, with a total success rate of more than 95%. Also, laparoscopic

pyeloplasty has a number of advantages, such as: short hospital stay, minimal blood loss, less severe pain syndrome in the postoperative period, early recovery after surgery, better cosmetic effect. Improved visualization, the accumulation of experience and the improvement of surgical skills have made it possible to use widely laparoscopic access [13,14,15,16]. The method of postoperative drainage of the collective system of the kidney is also not fully defined: to apply antegrade or retrograde stenting, to use pyelostoma or nephrostomy, or to use their combination. There are works devoted to the study and comparison of these methods [17,18,19]. Thus, nowadays the optimal variant of removing urine from the kidney after such operations has not been finally

determined. In this paper, we present our experience of performing laparoscopic pyeloplasty and compare the use of various options for urinary tract drainage after these operations.

MATERIALS AND METHODS OF RESEARCH

In total, 64 (100%) pyeloplasties were performed in children with congenital hydronephrosis at the age of 3 months to 18 years in the Urological department of the Pediatric Center, Republican Hospital №1, National Centre of Medicine, from November 2011 to March 2016. The cause of obstruction in 51 patients (79.6%) was segmental dysplasia of the ureter wall and aberrant (crossing) vessel was detected in 13 children (10.4%). Laparoscopic access surgery was performed by 22 children (34%) in the age group 5-17 years. The reason for the X-ray-urological examination was the detection of the expansion of the CPS in a screening ultrasound study. The standard examination included ultrasound of the kidneys, excretory urography, mictorial cystography. As additional diagnostic methods we used diuretic sonography, X-ray-computer tomography with intravenous contrast study and static nephroscintigraphy. The indication for surgical treatment was an increase in the dynamics of the size of the CPS with hydronephrosis of 2nd degree, hydronephrosis of 3d and 4th degrees. Three children with hydronephrosis of 4th degree 2 months before the operation were drained the calyxo-pulmonary system of the kidney by performing a hanging nephrostomy followed by an evaluation of the function.

The technique of laparoscopic pyeloplasty: we used 5 mm laparoscopic instruments. In most cases, access to the pyeloureteral segment was achieved by mobilizing the descending or ascending colon (depending on the side of the operation) medially, followed by exposure of the paranal space and access to the pyeloureteral segment. Classically the pelvis crossed in an oblique direction, the ureter in the longitudinal along the anti-brazier margin. Drainage was used in various ways. In the formation of anastomosis monofilament suture material PDS 5/0 or vicryl 5/0 was used. High-definition image and 5 mm instruments allowed to create a leak-proof anastomosis neatly, carefully comparing the edges of the pelvis and ureter.

Results of the study and discussion:

The results of operative treatment were evaluated according to the following parameters: duration of operation, time of hospitalization, complications.

The average operation time was 180 minutes (120-240 minutes). All children underwent pyeloplasty by Hines-Andersen. In 21 cases, ureteral stents were established, in 1 pyelostoma. There were no conversions. There were no intraoperative complications. Postoperative complications were revealed in 1 (4.5%) case - the development of urinary peritonitis due to the prolapse of the pyelostomy tube into the abdominal cavity. Laparoscopic suturing of the defect on the pelvis was performed, followed by recovery of the patient. The reason for the complication is the insufficiently reliable fixation of the pyelostomy tube to the pelvis and the use of the urethral catheter (size 10 Ch) with additional holes for these purposes. At present, we have adopted a tactic for the use of special pyelostomic tubes with a fixing curl in the pelvis for these purposes. The postoperative bed-days after laparoscopic pyeloplasty were 8-21 days, the average number of bed-days was 13.4 days. A prolonged postoperative bed-day in some cases is associated with the inability to re-hospital the child to remove the stent after 1-1.5 months because of the remote residence and high cost of air travel. In such cases, the child was in the department without an extract until the stent was removed 10-16 days after the operation. The examination was carried out 1 and 2 years after the operation. There are no recurrences to date. Patients achieved positive echographic signs of resolving obstruction in the form of a reduction in the renal collecting system, increasing the thickness of the parenchyma, and improving the parameters of the parenchymal blood flow. There were no signs of recurrence of urinary tract infection. The ratio of methods of drainage of the renal collecting system in our patients is presented in Table 1. As can be seen from the presented data, most patients underwent antegrade intraoperative drainage of the «double J» stent. The system of internal drainage was established after the formation of one of the semicircles of the anastomosis through a separate puncture of the abdominal wall or through a manipulative trocar. The stent was removed in 1-1.5 months after the operation during

cystoscopy. The duration of drainage was determined by the timing of completion of reparative processes in the area of anastomosis. The impossibility of antegrade stent placement was noted by us in 1 child. In this case, the obstruction was localized at the level of the uretero-vesical segment. Retrograde preoperative stenting in children is not always successful due to the peculiarities of the pathological process in the region of the pyeloureteral segment.

Laparoscopic pyeloplasty is now becoming the most common method for treating the obstruction of the pyeloureteral segment in children, with efficacy comparable to the results of open surgery, and the incidence of complications is reduced from 36% to 2% [5,9,10]. With laparoscopic pyeloplasty there are certain advantages in comparison with open surgery: good visualization of anatomical structures due to optical magnification, local isolation of the pyeloureteral segment, sufficient working space for performing pyeloureteroanastomosis, good cosmetic effect, short postoperative period and rapid recovery of physical activity.

At present, there is no consensus on the optimal way of draining the pelvis. We have experience of retrograde stenting before surgery, antegrade stenting during surgery, pyelostomy and pre-puncture nephrostomy. We do not apply non-drainage techniques for laparoscopic pyeloplasty, relying on the experience of performing non-drainage lumbar operations, when in some cases a prolonged (up to 2-5 days) urine leakage through safety paranal drainage is maintained. In our opinion, with non-drainage pyeloplasty, the risk of complications (blood clot in the pelvis, leakage of the anastomosis, swelling of the anastomosis) is great, which can have very serious consequences. These conditions with adequate drainage of the kidney will not lead to complications, or their number will be much smaller. The use of internal drainage ensures correct positioning and «splinting» of the anastomosis zone, prevention of postoperative obstruction and stable drainage of urine. The most common variant of drainage is the installation of an internal «double-J» stent. To the

Methods of drainage of the pelvis

	Antegrade stenting	Retrograde stenting	Pyelostomy	Puncture nephrostomy
Lumbar plastic of the pyeloureteral segment	30	9	2	1
Laparoscopic plastic of the pyeloureteral segment	19	2	1	0

disadvantages of the internal stent, some authors consider the necessity of its removal under anesthesia [20]. The most common complications of internal stent drainage are urinary tract infections [20-22] and stent migration [23]. Advantages of internal drainage are the possibility of prolonged passage of urine without contact of drainage with the external environment, which, with proper stent placement, does not lead to severe social disadaptation of the patient and reduces the risk of inflammatory complications [24]. However, along with the advantages of internal drainage, there are disadvantages. So, often a measure with the use of an internal stent requires the installation of a urethral catheter in the bladder to prevent urine reflux through the stent and the need for subsequent cystoscopy to remove the stent, which can lead to complications such as orhoepididymitis, prostatitis, urethral stricture [25,26]. The advantage of pyelostomy drainage is in providing more adequate urine diversion and the ability to visually control the amount of urine released, and their removal does not require endoscopic intervention. The disadvantage of pyelostomic drainage can be considered the elongation of the patient's stay in the hospital and the absence of frame drainage of the anastomosis zone, the risk of infection increases, the patient feels discomfort at the outlet of the drainage, the leakage of urine through the fistula after drainage removal [27]. Another disadvantage of this method is the impossibility of checking the patency of the anastomosis before removal of the pyelostoma. As follows from the presented data, the question of optimal intraoperative drainage of the pelvis remains controversial. In our opinion, the ideal method does not yet exist. And further study of this issue is seen in the application of different options for the derivation of urine, depending on the age of the patient or the degree of hydronephrosis transformation.

CONCLUSION

Thus, in our opinion, endosurgical pyeloplasty in children seems to be an effective and safe method of correction of the defect, consistent with the principles of minimally invasive surgery. But the necessary condition for high effectiveness of the method is sufficient experience, professional skills of the surgeon, use of

quality endosurgical instruments and the correct choice of draining of the pelvis.

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THE EXPERIENCE OF APPLICATION OF THE URETHROPLASTY BY SNODGRASS

ABSTRACT

The revolution in urethroplasty became the method of an American professor Warren Snodgrass, who proposed in 1996 to dissect the urethral area and form a urethra (TIP-tubularized incized plate) from it, and the formed defect healed by secondary tension. Currently, the operation by Snodgrass is the latest achievement of surgery, which cannot be performed by every doctor. In the presented work a new method of urethroplasty is analyzed and introduced into clinical practice, performed on the basis of the Urology department of the PC RHN#1-NCM.

Key words: hypospadias, children's urology, urethroplasty.

INTRODUCTION

The subject of this method is topical, as it is devoted to modern surgical aspects of treating patients with the malformation of the urinary system as hypospadias. Surgical treatment of this disease has undergone significant changes and nowadays there is no single approach to the treatment of congenital malformation [1, 2]. The number of different methods of urethroplasty exceeds 500 variants, this indicates that there is no «gold standard» in the treatment of hypospadias. But despite of it, in the last decade, the results of hypospadias treatment have significantly improved. First of all it involves the use of microsurgical instruments, modern ultra-thin synthetic material and optical zoom [3, 4, 5]. But the search for new variants of urethroplasty takes place.

Objective is to improve the results of surgical treatment of children with hypospadias by putting into practice modern methods of correction of defects, in particular, the technique of urethroplasty by Snodgrass into clinical practice of surgical treatment in children with hypospadias.

MATERIALS AND METHODS

Since January 2013, a new kind of urethroplasty by Snodgrass has been introduced in the Urological Department PC RHN#1-NCM. By January, 2016, 27 urethroplasties were performed using this method for children with hypospadias of capitate and stem forms. Children's age: 18 months - 6 years.

Complaints at admission: deformation of the penis, cosmetic defect of the foreskin, atypical urination (female type), difficulty urination.

Preoperative examination included: general clinical minimum (blood tests, urine tests), ultrasonic examination of the urinary system and pelvic organs.

In addition, according to the indications: urinal tests. Urine inoculation for sterility, determination of sexual

chromatin and content of 17 KS in the urine followed by consultation in the medical genetic laboratory, micturating cystography, urethroscopy, uroflowmetry.

The combination of hypospadias with congenital anomalies of the urinary system was noted in 11% of patients: inguinal hernia and dropsy of testicular membranes – 2, cryptorchidism - 1.

The preoperative examination changed the tactics of treatment in a number of patients with hypospadias.

All operations on the urethra plastic were performed after the elimination of the concomitant pathology (Table).

Two patients underwent recurrent operations. Indication for the operative correction of hypospadias was the elimination of the functional and cosmetic defect of the penis. Criteria for assessing the results of surgical treatment of patients:

1. Presence of complaints from the patient and parents;
2. Urodynamic characteristics: the direction of the urine stream and its characteristics (stress, duration of urination, etc.);
3. Cosmetic: appearance of the penis (the presence of deformity, the shape of balanus, the place and shape of the external urethral opening, etc.);
4. Socio-psychological (criticism of the patient to himself, problems in the team, etc.).

The purposes of the operation with hypospadias are:

1. Complete elimination of curvature of the penis and restoration of a normal erection;
2. Formation of the missing part of the urethra, free from hair, strictures and fistulas and movement of the external urethral opening on the penis balanus;
3. Restoration of the passage of urine on the urethra;
4. Restoration of the appearance of the penis;
5. Restoration of normal sexual

function.

The basic principle of all single-stage plastic used in the clinic is a full exposure of the cavernous body of the penis, which allows to excise fibrotic bands more carefully, to assess the degree of dysplasia of the skin and prepare the stock of plastic material for the main and final phase of the operation - the urethra plastic and closure of the penis.

Urethroplasty by Snodgrass consists in cutting out and mobilization of the flap at a site bordering urethral meatus (by Dupley type) and then a longitudinal incision of urethral plate to a depth of cavernous bodies is performed, which leads to a significant increase of the total area of urethral plate (to 2-3 times). Next urethroplasty on age-gauge catheter is performed without any tension of neourethry tissue and without the risk of the fistula formation in this place. In the future, the formed urethral defect is completely epithelialized, which reduces the likelihood of fistula formation. In the future, the trunk of the penis is closed by skin flaps from the foreskin. All operations were performed under optical magnification using atraumatic suture material.

In the postoperative period, we used polyvinylchloride urethral catheters for urinary diversion. The optimum was catheter insertion at 1-2 cm proximal to the internal sphincter, which allowed to produce a prolonged drainage of the bladder without signs of cystalgia. Transurethral derivation was carried out for 10 days.

At the end of the operation, a gauze pad impregnated with glycerin was applied.

Distribution of operated patients with different forms of hypospadias

Form	Number of patients, abs. number, %	Number of operations
Balanic	17 (63)	17
Penile	10 (37)	12
Total:	27 (100)	29

After that, the compression bandage was applied with a gauze or elastic bandage spiral, from the penis balanus to the base. Stitches in the postoperative period were not removed in view of lysis of the suture material within 2-3 months.

RESULTS OF THE STUDY

27 urethroplasties were performed by Snodgrass. The average age of boys was 4 years. Age of 2 years is considered to be preferred age for urethroplasty, because in this case the penis becomes larger and the children underwent easier inpatient care. The duration of the operation was 55 minutes on average. The elastic bandage is applied for 5 days. The duration of the catheterization of the bladder is 10 days. Antibiotic therapy in the postoperative period was performed with the use of broad-spectrum antibiotics. Antibiotic treatment lasts until the catheter is removed, with the first injection of an antibiotic performed before the operation for the purpose of perioperative antibiotic prophylaxis. A week later uroseptics were prescribed for 10-14 days. The average duration of inpatient care after the operation is 12 days (dressings, physiotherapy). Complications took place in two patients (7.4%) in the form of a fistula urethra (1 case) and meatostenosis (1 case). These children underwent operations on suturing the fistula and meatotomy, dissection of external urethral opening. In the future the complications were not observed.

CONCLUSIONS

1. The method of one-stage correction of hypospadias by Snodgrass allows to eliminate malformation in the early periods practically at any distal and

average form of the defect.

2. Correction of hypospadias with the help of urethroplasty by Snodgrass causes postoperative complications with a low frequency (7.4%).

3. The effective method for postoperative urine diversion is transurethral urine derivation.

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LONG-TERM RESULTS OF TREATMENT OF SACRO-COCCYX AREA TERATOMAS

ABSTRACT

The article presents the results of treatment of sacro-coccygeal teratomas in newborns in the period from 2001 to 2015. In the majority of the newborns the pathology was detected prenatally. The level of AFP in the neonatal period is not a diagnostic criterion of malignancy, but it can serve as a screening method in the postoperative period. In the postoperative period, patients should be observed in a pediatric oncologist at any histological conclusion, as the probability of malignancy and recurrence of the tumor is high thereafter. In 30% of cases there is a malignant course of sacro-coccygeal teratoma.

Keywords: teratoma, malignancy.

Teratomas of the sacro-coccygeal area are one of the frequent malformations, which are more often detected in the period of newborn or antenatal. In large teratomas, a prenatal consultation is conducted to determine the mode of

delivery. Teratomas of predominantly retroperitoneal arrangement may appear later with a rectal compression clinic or dysuric symptoms. In most cases, the diagnosis of sacro-coccygeal teratomas does not cause difficulties, as a rule, early

surgical intervention is performed [1, 2]. Further tactics is decided by the results of a histological study of the removed tumor. But the statement of a benign tumor variant does not exclude careful observation of the child, since there are

cases of detection of a recurrent tumor or distant metastases with age.

Objective: to study the long-term results of the treatment of sacro-coccygeal teratomas in newborns.

MATERIALS AND METHODS OF RESEARCH

For 15 years (2001-2015), 10 newborns were operated in the surgical department of the Pediatric Center of the Republican Hospital No. 1 of the National Center of Medicine for the teratoma of the sacro-coccygeal area. Newborns entered at the age of 1 - 5 days of life: 9 from the maternity hospitals of Yakutsk, 1 was transported from the district hospital. Upon admission all newborns were carried out ultrasound of the tumor, small pelvis, MRI of the sacro-coccygeal region, and the analysis for the AFP level was taken. 40% of teratomas were cystic, mixed - 40%, a solid structure was detected in 20% of cases. According to the classification, there were variants of type I - 10%, type II - 50%, type III - 40%, type IV - not identified. In 1 case, the teratoma of the sacro-coccygeal area was detected antenatally in a triplet girl, due to the immaturity and low weight of the baby, the tumor was removed at the age of 3 weeks, the rest of the newborns were operated in the first week of life. In 1 case, at the stage of CRH, an atypical location of a moderate-sized teratoma in the gluteal region of the newborn was regarded as a post-injection abscess and an opening of the tumor cavity was carried out. The girl was sent to the Pediatric center by the sanatorium, she was operated on the 3rd day of her life after the post-examination.

RESULTS

In all children, the AFP level was elevated and averaged 1500 IU. The operations are performed by sacral transverse access with obligatory tailbone resection. According to urgent indications for the first day of life, a child with a giant teratoma of the sacro-coccygeal area was operated (Fig. 1), the tumor was removed with coccyx resection without technical difficulties, a mature teratoma was histologically established.

Postoperative complications were observed in two cases. In the first case, a submucosal wound of the urethra occurred during the installation of a metallic urethral catheter, and subsequently we refused from such catheterisations. In another case, in the early postoperative period, a fistula of the rectum opened on the postoperative wound, during surgery the wound of the intestine was not established. Patient was imposed a preventive colostomy,

fistula of the rectum closed against a background of conservative measures, after 6 months after the control MRI of the sacro-coccygeal area, the colostomy of the colon was eliminated.

In 1 case, an immature teratoma was histologically detected, the child underwent polychemotherapy, the girl is observed with an oncologist. After the removal of the giant teratoma of the sacro-coccygeal area in a distant period, the patient had a recurrent tumor. The child was observed after the operation: every 6 months the surgeon, oncologist, digital rectal examination, perineal ultrasound and retroperitoneal space were examined. The boy entered the surgical department at the age of 2 years with a clinic of relapsing low intestinal obstruction, a small pelvic tumor, squeezing the rectum, was operated. Histologically a yolk sac tumor was developed, and a course of polychemotherapy with a lethal outcome was transferred.

We represent the clinical case of the teratoma of the sacro-coccygeal area: the girl was operated in the newborn period

for the teratoma of type II, the tumor was removed with coccyx resection, radically, the histological conclusion was a mature teratoma, the AFP level before surgery was moderately elevated, and after surgery the AFP level was stable. The child was observed in the pediatric surgeon, a stationary examination was performed in the surgical department in 6 months after the operation: the perineal and retroperitoneal MRI was performed, 1.5 x 1.0 cm formation was detected on the scar, the oncomarkers were within the age limit. At the age of 1,5 years with the next hospitalization, the level of AFP - 46105 IU / ml, complaints of constipation, dysuric phenomena. During the examination, a recurrent tumor was diagnosed in the pelvic cavity with sprouting into the lumen of the inferior vena cava, metastasis to the lungs, liver, soft tissue of the right gluteal region (Fig. 2, 3).

Thus, the percentage of malignancy in our study was 30%, in 2/3 of which malignancy was detected in the long-term period. Considering the high risk



Fig.1. Giant teratoma of the sacro-coccygeal area

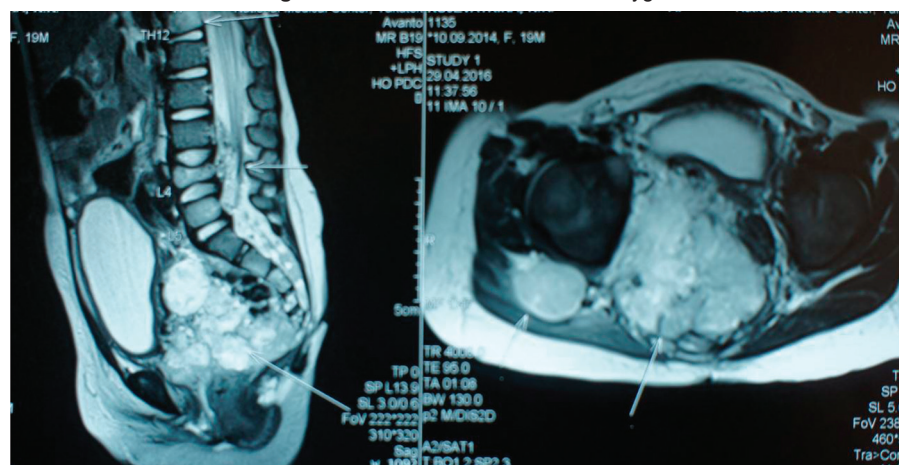


Fig. 2. Recurrent tumor of the pelvis and perineum

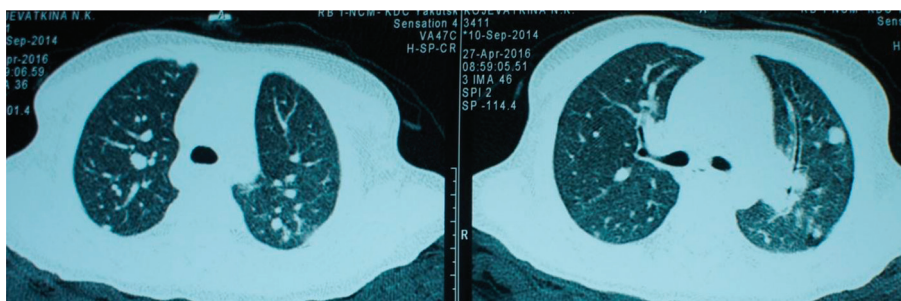


Fig.3. Remote metastases to the lungs in a child of 1.5 years

of recurrence and metastasis of the tumor in the postoperative period, despite the establishment of a benign variant of tumor, the patients after the operation must necessarily be observed in a pediatric oncologist. In our study, all children in the postoperative period were under the supervision of a pediatric surgeon, AFP screening, examination of a surgeon, ultrasound of the perineum and retroperitoneal space were carried out once every 6 months, and in the first 6 months after the operation - MRI under a general sedation inpatiently.

CONCLUSIONS

1. Teratomas of the sacro-coccygeal area are in most cases diagnosed antenatally (80% according to the study).
2. The level of AFP in the neonatal period is not a diagnostic criterion of malignancy, but it can serve as a

screening method in the postoperative period.

3. In the postoperative period, patients should be observed in a pediatric oncologist at any histological conclusion, as the probability of malignancy and recurrence of the tumor is high thereafter.

4. In 30% of cases in our study, the teratoma of the sacro-coccygeal area gave malignancy.

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OPTIMIZATION OF SURGICAL TREATMENT OF ACUTE ADHESIVE INTESTINAL OBSTRUCTION IN CHILDREN

ABSTRACT

The article describes the experience of treatment of acute adhesive intestinal obstruction. The authors analyzed the literature data of etiopathogenesis of the disease, changed terms of radiological investigations, diagnostic laparoscopy is used for diagnosis and assessment of severity of adhesions in children. The effectiveness of the using of laparoscopy in urgent inflammatory operations in children in reducing the frequency of adhesive intestinal obstruction is proved; diagrams of prevention of adhesion obstruction of the abdomen are given. As a result of activities, the frequency of intra-abdominal complications reduced to three times.

Keywords: adhesive intestinal obstruction, children, laparoscopy.

RELEVANCE

At present, in the modern emergency abdominal surgery of children, the problem of adhesion process has not lost its relevance. Despite of the intensive development of minimally invasive technologies in abdominal surgery, when with the help of high-tech equipment it is possible to reduce significantly the traumatic nature of surgical interventions, the number of immediate and long-term

complications caused by the adhesive process does not decrease [2]. About 1% of all hospital admissions to surgical hospitals and 3% of laparotomy are performed about adhesive disease, and in 60-90% of cases these processes are the cause of the acute intestinal obstruction [4].

According to the literature, 55-70% [1, 2, 3, 4, 5, 6] of patients after abdominal surgery have the adhesion process

in abdominal cavity that can lead to such a severe complication as acute adhesive intestinal obstruction (AAIO) [1]. Postoperative lethality in unfavorable course of AAIO is 16-25% [4].

At present, the issue of timely diagnosis of acute adhesive process remains topical, despite of the existing recommendations for the diagnosis of adhesive intestinal obstruction. The intraoperative pattern is presented by

irreversible ischemic impairment of blood supply. The traditional radiological method widely used so far for this purpose, the passage of barium, the recommended multiplicity of radiological investigations are not sufficient for the timely diagnosis of acute conditions. In this regard, the change in the interpretation and multiplicity of the investigations and the use of highly informative diagnostic methods for AAIO (laparoscopy, ultrasound) are topical.

Postoperative adhesions disrupt the quality of life of young people all over the world, leading to repeated surgical operations, chronic pelvic pain and female infertility [3, 6]. The main cause of adhesions is the operations performed on the abdominal organs for inflammation, primarily for acute appendicitis and its complications.

Therefore, the search for reliable methods of early diagnosis and means of preventing the development of AAIO remains an actual problem in emergency abdominal surgery.

The aim of the research was to improve the results of surgical treatment of children with acute adhesive intestinal obstruction.

MATERIALS AND METHODS

In our research we examined the status of a patient in admission, the analysis of radiological investigations, the intraoperative pattern, the choice of surgical technique and the presence of postoperative complications.

Since October, 2005 laparoscopic appendectomy has been the main method in our clinic in emergency surgery. In 2006, the extent of laparoscopic operations in urgent states was 15%, in 2014 laparoscopy was performed in 94.5% of cases with all urgent conditions. Most of emergency operations are carried out for acute appendicitis and its complications - 2388 appendectomies.

The analysis of patients operated for AAIO from 2006 to 2016 in the Department of Purulent surgery was carried out. In most cases (215), these were the patients after the surgery for diffuse appendicular peritonitis. The analysis does not include children who have been operated routinely. The age of the patients were from 4 to 14 years. The frequency of adhesive complications after laparoscopic treatment of appendicular peritonitis was 2 cases (0.93%). After laparotomy operations (some children were operated in central district hospitals), the incidence of AAIO was 8 cases (3.72%). All intra-abdominal adhesions developed when performing urgent surgical interventions, when purulent-inflammatory process was

localized in the abdominal cavity.

The extent and duration of conservative therapy, the terms of differential diagnostic activities in cases of suspected AAIO, depended on the stage and phase of disease.

For late adhesive intestinal obstruction (LAIO), when the main pathological mechanism is strangulation, patients are operated immediately upon admission to the hospital after short-term postoperative preparation. These measures in the acute phase of adhesive obstruction were no more than 3 hours. In 2 cases, when strangulation revealed an unavoidable change in intestine, the conversion and resection of the necrotic area was performed.

The complex of conservative therapy for early adhesive intestinal obstruction (EAIO) may be more prolonged. Diagnostic laparoscopy in almost all cases allowed to establish the correct diagnosis and it was performed in 4 cases.

The intraoperative pattern for acute adhesive intestinal obstruction depends on the degree of adhesion process and the method of the earlier performed operation. In 2 cases, the children were previously operated for diffuse peritonitis with laparostomy. When diagnostic laparoscopy was performed, unidentified adhesions in the laparotomic incision area were detected in these patients, it was possible to restore the intestinal permeability by laparoscopic viscerolysis with the help of electrosurgical equipment «Harmonic». In 4 patients operated early in CDH for diffuse peritonitis with laparotomic access without laparostomy, the attempt of laparoscopic viscerolysis was unsuccessful because of the severity of the paresis and adhesion process in the intestine.

In the case of massive, adhesive processes, a laparotomy was performed with software sanitation of the abdominal cavity and using a gentle "manual decompression" technique of the contents of the small intestine into a thick one. The intestinal loops were laid using the method of intestinoplication by Noble, without the use of adhesive substances (1 case).

RESULTS AND DISCUSSION

The traditional radiopaque method for diagnosis of acute adhesive intestinal obstruction is informative for the diagnosis of EAIO, it takes a long time to confirm or exclude this disease. For LAIO, the presence of clinical symptoms of strangulation, radiological investigations should be performed every 1-2 hours.

The use of laparoscopy in the most frequent urgent operations in children

- with acute appendicitis, purulent peritonitis and intussusception, can significantly reduce the percentage of postoperative adhesions.

Diagnostic laparoscopy in the AAIO allows to confirm or exclude the diagnosis and estimate the prevalence of adhesions and choose the optimal surgical treatment tactics.

In laparotomy operations, the method of choosing to perform decompression of the intestine is the method of sparing «decanting» of chyme into the large intestine, which leads to an earlier recovery of intestinal peristalsis, reduction in postoperative complications. In addition, we perform a blockade of the mesentery of the small intestine with a 0.25% solution of novocaine in a volume ranging from 20-30 ml to 60-80 ml, depending on the age of a child.

In a part of children with a tendency to form keloid scars prognostically we can expect the development of postoperative adhesions complications. To this group of patients we consider to prescribe a preventive course of treatment of such complications with drugs that reduce the synthesis of collagen. We conducted a course of therapy with Cuprenyl in capsules from 7th day after laparoscopic operation and from 10th day after traditional operation (after removal of the joints) once a day for 14-21 days in the following dosage: up to 6 years - 0.7 mg (1/2 capsule), 6-14 years - 0.15 mg (1 capsule), over 14 years - 0.3 mg (2 capsules) and a course of electrophoresis with potassium iodide lasting 10 sessions.

Macrophages, plasma proteins with a high concentration of fibrinogen, mesotheliocytes play a major role in the development of adhesions and they are present in the post-operative fluid of the abdominal cavity. Extensive soft adhesions are formed within 72 hours after laparotomy. Programmed sanitation of the abdominal cavity, conducted after 48 hours, reduces the development of a massive adhesive process in the abdominal cavity. Refusal from suture the peritoneum with laparotomy also reduces the risk of adhesion formation.

After discharge from the hospital, all patients are on dispensary registration with a pediatric surgeon in a polyclinic at the place of residence, and 2 times a year they undergo anti-adhesion physiotherapy.

CONCLUSION

Thus, in order to improve the diagnosis and treatment of patients with various forms of AAIO, diagnostic laparoscopy should be used more widely. As AAIO often occurs after surgical interventions for acute appendicitis, especially its

complicated forms, so laparoscopic appendectomy and abdominal sanitation are advisable in order to significantly reduce the level of intra-abdominal adhesions in these diseases. As a result of optimization of surgical treatment of urgent abdominal pathology in children, the frequency of adhesive intestinal obstruction in the Purulent Surgery Department of the Pediatric Center decreased from 3.25% three times.

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PERIOPERATIVE ANTIBIOTIC PROPHYLAXIS AND ETIOTROPIC ANTIBACTERIAL TREATMENT OF APPENDICULAR PERITONITIS IN CHILDREN

ABSTRACT

The article describes the analysis of perioperative antibiotic prophylaxis and etiotropic antibacterial treatment of appendicular peritonitis in children on the data of the Purulent Surgery Department of the Pediatric center RH №1 - NCM of Yakutsk, Republic Sakha (Yakutia). We proved effectiveness of perioperative antibiotic prophylaxis, the incidence of infections complicating surgical interventions has decreased. Etiotropic antibacterial treatment of appendicular peritonitis in children reduced the frequency of intra-abdominal complications to three times.

Keywords: perioperative antibiotic prophylaxis, complicated appendicitis, children.

BACKGROUND

Perioperative antibiotic prophylaxis (PAP) at abdominal surgery with a risk of purulent-inflammatory complications is a compulsory measure. Most domestic authors are united in their views regarding the appointment of perioperative antibiotic prophylaxis, but the choice of drug, its efficiency, manifested in the reduction of infections in the field of surgery in pediatric surgery remains debatable.

The priority role of antimicrobial therapy in the treatment of purulent process is obvious, its adequacy largely determines the outcome of

the treatment. The selection of the right modes and schemes of ABT is able to stop the course of infection to improve the prognosis and reduce treatment time. Meanwhile, the question about the rationality of the purpose of ABT. One of the ways to improve the efficiency of ABT is the full possession of information about the etiology of the pathogen and its sensitivity. The data on microbial structure, its dynamics and antibiotic resistance of microorganisms, the resulting large-scale multicenter studies it is impossible to fully use when conducting antimicrobial therapy

in the conditions of a particular region. Each region has a number of distinctive features requiring consideration in the planning of antimicrobial therapy.

The above facts explain the need for analysis of the etiological agent and its sensitivity to antibiotics.

MATERIALS AND METHODS

Every year in the purulent surgery department of the Pediatric center of Republican hospital №1 – National center of medicine of Yakutsk is carried out more than 250 operations for acute appendicitis and its complications. From 2006 to 2016 operated 2388 children

under 14 years inclusive at acute appendicitis and its complications. In complicated appendicitis was carried out the drainage, when heavy late in peritonitis the method of choice in the treatment of was software sanitation of abdominal cavity. From 223 children (9%) had complications of acute appendicitis with local peritonitis was revealed in 126 cases, appendicular infiltrate in 6 cases, periappendicular abscess in 26 cases, diffuse – 65.

THE RESULTS OF THE STUDY

We analyzed perioperative antibiotic prophylaxis (PAP), the incidence of infection in the area of surgical intervention in the Department of purulent surgery, surgery for acute appendicitis.

The object of the retrospective study was history of 1368 children who underwent appendectomy in 2008 - 2014. From this group excluded patients with complicated appendicitis. According to the existing international recommendations in the quality product for DAD at appendectomy were selected amoxicillin/clavulanate (Amoxiclav). This drug has a high activity against the most common pathogens iohw for appendicitis (gram-negative organisms and anaerobes). 2012-Amoxiclav was administered at a dose of 30 mg/kg once intravenously 30 minutes before the start of the operation, or cephalosporins 2nd generation. The effectiveness of prophylactic antibiotic administration was evaluated according to the incidence of infection in the field of surgical intervention in the postoperative period.

The analysis showed that until 2011, when not held perioperative antibiotic prophylaxis, the frequency of infections in the surgical intervention was 7.5%. After turning on perioperative antibiotic prophylaxis is mandatory in practice, the frequency of infections in the field of surgical intervention has decreased significantly and amounted to 0.44 percent.

Antibiotic therapy after surgery are appointed on the basis of identifying the etiologic agent, the most significant of the pathogen. In bacteriological sowing purulent effusion from the peritoneal cavity in our study, the dominant etiologic agents were gram-negative bacteria of the family Enterobacteriaceae (*Escherichia coli* – 60,29%), 5.14% in Association

with *Pseudomonas aeruginosa*, sensitive to gentamicin, amikacin, ciprofloxacin. 8.82% of *Pseudomonas aeruginosa* were sown as the only causative agent sensitive to ciprofloxacin, cefepime and imipenem. *Enterococcus faecium* was sown 2.94%, in one patient the Association of *Escherichia coli*, *Pseudomonas aeruginosa* and *Enterococcus Faecium* proceeded in the postoperative period with the formation of somawansa intestinal abscess that required reoperation. Combined flora identified 11.02% - *Str. Faeceum*, *adorifera Serratia*, *aspergillus* spp, staph epidermidis, kl pneumonia. The lack of growth identified in the 16,91% of cases, which, in our opinion, is connected with a preceding antibiotic therapy for patients transferred from other hospitals.

Antibacterial treatment of appendicular acute peritonitis is empirical and is determined based on the most significant pathogen (*Escherichia coli* – 60,29%). Currently as the drug of choice for initial therapy are appointed cephalosporin 3 generation, which allow to effectively influence important aerobic and anaerobic bacteria. Alternative its use in combination with metronidazole +/- aminoglycoside. When «late» in peritonitis, when in most cases, children receive these or other antibacterial drugs, the drug of choice are cephalosporins 3-4 gen + metronidazole, cefoperazone/sulbactam. When the refractory peritonitis, complicated course were appointed carbapenem, cefepime+metronidazole. The allocation metitillinrezistentnykh staphylococci the drug of choice was linezolid, glycopeptide, which was confirmed by the scale of sensitivity of the microbial agent. Prevention of intra-abdominal candidiasis was conducted in parallel with fluconazole.

CONCLUSION

Thus, the rational use of perioperative antibiotic prophylaxis reduces the incidence of iohw in our Department, from 7.5% to 0.44% of cases with acute appendicitis. Etiotropic antibacterial treatment of appendicular peritonitis in children, decreased the frequency of intra-abdominal complications from 3.25% to three times.

There were no lethal outcomes over the past 10 years.

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INFREQUENT COMBINATION OF THE CONGENITAL PYLOROSTENOSIS AND MEMBRANE OF PYLORIC DEPARTMENT OF THE STOMACH (clinical case)

ABSTRACT

The exceptional case from clinical practice – a combination of a congenital hypertrophic pylorostenosis to a membrane of the piloryc channel of a stomach at the child of an age of 1 month who was admitted with an X-ray and clinic picture of a partial high intestinal obstruction is presented. The membrane of the piloryc channel of a stomach is found during a repeated operative measure when performing intraoperative fibrogastroscopy.

Keywords: membrane of the piloryc channel, congenital hypertrophic pylorostenosis, high intestinal obstruction, obstruction of a stomach.

INTRODUCTION

Obstruction of the stomach in children is manifested by the following main symptoms: vomiting, bloating in the epigastric region, hypotrophy. Of the listed symptoms in the first place is, of course, vomiting without an admixture of bile in the vomit mass, which is the main distinguishing sign of stomach obstruction. More often this symptom in children speaks about hypertrophic pylorostenosis. However, signs of obstruction can also be caused by other causes of an innate nature, which are less common and not always acute. It is the membrane of the antrum of the stomach, the doubling of the stomach [1]. The frequency of congenital diseases of the digestive system continues to increase steadily every year [2]. Congenital partial obstruction of the stomach caused by the prepyloric membrane, refers to the rare malformations of the gastrointestinal tract in children with a frequency of occurrence of 1 case per 4000 labors [3, 4].

In available literature we did not find a similar combination of defects of the top departments of digestive tract.

Clinical case. Boy E., 1 month, admitted on January 13, 2017 in the surgical department with a diagnosis of congenital hypertrophic pylorostenosis. A boy from the 1st pregnancy, which was taking place against a background of toxicosis in the 2-3 trimester. First labor is on time, independent. Weight at birth is 3,080 grams, height is 48 cm. It is known from an anamnesis that the baby had breast feeding up to 3 weeks. From the second week after birth, mother notes «projectile» vomiting after each feeding, without any bile, «curdled» milk. There was a gradual loss of body weight, constipations were observed. He was examined by the district pediatrician

with transfer to the antireflux milk formula «Semilak»; he was hospitalized in the central regional hospital. The ultrasound examination of the stomach, the pyloric part showed that there was anechogonic liquid with hyperechogonic inclusion contents in the volume of about 70 ml in the stomach, the lumen of the stomach is significantly expanded, the rosette of the cardia is closed, the diameter of the rosette is 11 mm, the walls are up to 5 mm. The pylorus is up to 12 mm in diameter, the thickness of the muscle layer is up to 6 mm, the narrowing zone is visible for up to 3.5-4 cm, the lumen is considerably narrowed, in the lumen a thin band with a faint echo. The conclusion is the signs of congenital hypertrophic pylorostenosis. Radiography with barium meal showed that there is an enlarged stomach with a level of fluid on the overview radiograph of the abdominal cavity, a sufficient number of gases in the intestine, in pictures with contrast material, prolonged retention of barium in the enlarged stomach, «segmenting the peristalsis» of the stomach, reduced intestinal gas filling (Fig. 1). The child is transferred for further treatment to the surgical department of the Pediatric Center.

At admission, the condition of the child is severe, due to malformations, exsiccosis, severe hypotrophy. The integument is clean, subic, and the skin turgor is sharply reduced. The thorax of the correct form, symmetrically participates in the act of breathing. Auscultatory in the lungs, breathing is puerile, carried out in all departments, there is no wheezing. Heart tone is clear, sonorous. HR of 126 per minute. The belly is sunken, a symptom of the «hourglass» is noted. When palpation in the right hypochondrium, there is an oval, mobile, dense formation. Stool has

a tendency to constipation. The child was hospitalized in the intensive care unit for preoperative preparation. The pylorus was examined by ultrasound, an anechoic, rounded formation, 35x20 mm in diameter, with heterogeneous contents (with a hyperechoic level) was found in the epigastrium. After preoperative preparation, on January 16, 2017 the boy was taken for an operation with a diagnosis: congenital hypertrophic pylorostenosis. A traditional extrinsic pyloromyotomy according to Fred-Ramstedt was performed. In the early postoperative period, repeated vomiting without bile was retained, it was impossible to begin enteral load. On January 18, 2017 fibrogastroscopy was performed, which revealed erosive-hemorrhagic esophagitis, pilorospasm. Consultation of a neurologist showed PA CNS of a mixed genesis, spastic tetraparesis. On January 19, 2017



Fig.1. Rg of patient E. Passage of barium. Extended stomach.



Fig.2. Segmenting peristalsis of the stomach.



Fig.3. Satisfactory gas filling of the intestinal loops, «reduction» of the stomach

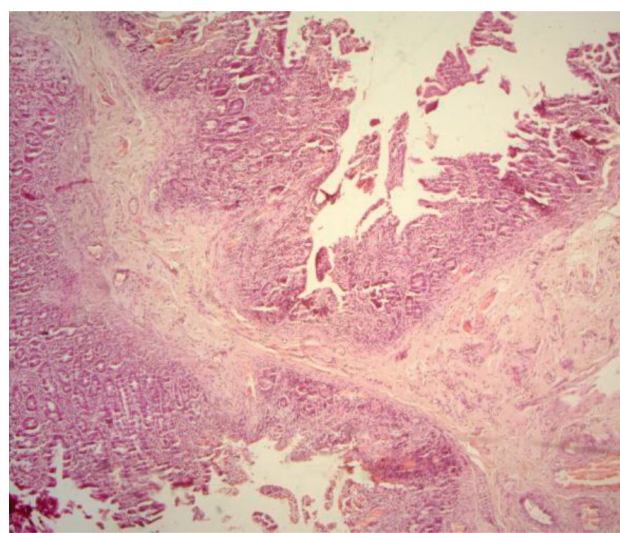


Fig. 4 Prepyloric membrane preparation after membrane excision.

passage of barium was held, in which a large amount of contrast was retained in the stomach, in the loops of the intestine was not determined. A consultation was held, in which it was decided to take the child for a second operation because of the ineffectiveness of the primary pyloromyotomy. Relaparotomy was performed on January 20, 2017: a pyloric section of the stomach with dimensions of 3.0x2.0 cm, whitish, cartilaginous density was excreted into the wound. The site of the previous pyloromyotomy was been examined, a depth and length cut was sufficient, but there was no bulging of the mucosa, which was regarded by us as insufficient dilution of the edges. The wound of the pylorus was sewn. Above and below, 2 extra-porous pyloromyotomies by Ramstedt were performed. On January 21, 2017 enteral load was started, while vomiting was repeated up to 10 times a day, there was no stool. The patient was transferred to full parenteral nutrition. An overview X-ray of the abdominal cavity was performed, in which there was no evacuation of the contrast from the stomach, the gas filling of the intestine was also not detected, the stomach was sharply expanded, and its segmenting peristalsis was present (Fig. 2). On January 23, 2017 persisting phenomena of gastric obstruction are regarded as combined pre-pyloric obstruction, the membrane with a pinhole, undiagnosed earlier, was not excluded. On January 24, 2017, the patient was taken to second operation, intraoperative fibrogastroscopy was performed to clarify the nature of the pathology, according to which the pylorus was opened in the initial department, then the apparatus

in duodenum did not pass. The stitches from the first suture pyloromyotomy have been loosened, the pyloric canal mucosa has been opened. During the audit, an obstacle was found in the form of a dense membrane with a dotted hole in the prepyloric section, a circular section of the membrane was made. Enteric feeding tube was delivered to the duodenum, gastroduodenoanastomosis was applied. Postoperative diagnosis was congenital hypertrophic pylorostenosis, membrane of the prepyloric stomach. The control radiograph of the abdominal cavity in the intestinal loops showed sufficient gas filling, the stomach was «contracted» (Fig. 3). The course of the postoperative period was smooth. Histological conclusion: the material was represented by the mucous prepyloric section of the stomach with a submucosal layer, the muscle layer was absent (Fig. 4). On February 02, 2017 the child was discharged in a satisfactory state with an increase in body weight.

CONCLUSION

The described case shows the difficulty of timely diagnosis of the membrane of the prepyloric stomach in children, especially when this defect is combined with congenital hypertrophic pylorostenosis. Specialists dealing with the treatment of congenital malformations of the gastrointestinal tract should remember the possible combination of gastric malformations. At continued vomiting against the background of adequately performed pyloromyotomy and exclusion of non-surgical reasons for postoperative regurgitation, repeated intervention with mandatory intraoperative fibrogastroscopy is indicated.

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THE EXPERIENCE OF TRANSANAL ENDORECTAL RESECTION AND COLONIC RELEGATION AT HIRSCHSPRUNG'S DISEASE IN CHILDREN

ABSTRACT

In the surgical department of the Pediatric Center, since 2012, the method of transanal endorectal colonic resection at the recto-sigmoid form of Hirschsprung's disease according to De La Torre-Mondragon has been approved and introduced. Ten patients were treated by this method. Earlier, in the treatment of Hirschsprung's disease, methods of Duhamel, Soave-Lenyushkin, and Soave-Bolei were used. The operations were performed through the abdominal perineal access. Totally 32 operations were performed. A comparative evaluation of the outcomes of radical operations showed that in abdominal perineal proctoplasty of Soave-Lenyushkin and Duhamel the patients often have postoperative complications such as postoperative peritonitis, enterocolitis, encopresis, «residual» zone of aganglionosis, which required repeated operations and a long «cost» recovery. Similar complications were not observed after the transanal resection of De La Torre-Mondragon.

Keywords: children, aganglionosis, Hirschsprung's disease, complication, anastomosis.

INTRODUCTION

The most common cause of constipation of organic nature in children is Hirschsprung's disease. Treatment of Hirschsprung's disease remains an actual problem of pediatric surgery, despite of the 100th anniversary of the development of pathogenetic well-founded method of correction of the defect [1-3]. The problem of complications after primary radical operation in many patients is topical, some of them need repeated operations. The overall incidence of complications according to different authors is from 22.7% to 38.5%, including stool incontinence from 3.6% to 69%, constipation from 1.6% to 25%, enterocolitis from 1.4% to 28.5%, perianal dermatitis from 2.7% to 27.7% [1, 3, 4]. A large number of various methods of surgical correction of Hirschsprung's disease has been proposed, linked to a reduction of postoperative complications. Currently, the main task of the modern approach to the surgical treatment of colon aganglionosis is the minimization of the trauma of a radical operation, primarily by developing various minimally invasive modifications of the widely known techniques of Svenson, Soave, Duhamel. Children's surgeons are trying to find a certain compromise in the differential approach to choosing

the method of surgery. The most recent achievement is the radical operation of transanal endorectal colonic resection without laparotomy, described in 1998 by De la Torre Mondragon and Ortega, which gives excellent results in the recto-sigmoid form of Hirschsprung's disease [4].

MATERIALS AND METHODS OF RESEARCH

For the period 2012-2017 years 10 surgical interventions using the De La Torre-Mondragon method of transanal endorectal colonic resection in rectal and recto-sigmoid forms of Hirschsprung's disease were carried out. The age of children ranged from 10 months up to 8 years. Boys prevailed - 9 (90.0%), the girl was alone. Children with extended forms are excluded from this study.

For a comparative study of the results of surgical treatment of Hirschsprung's disease in the surgical department of the Pediatric Center, Republican Hospital №1, National Centre of Medicine, we conducted a retrospective analysis of the outcomes of surgical treatment using the Duhamel and Soave method in the modifications from 1991 to 2011. For that period 32 children were operated (4 by Duhamel method, 28 surgical interventions by Soave modifications).

At the operation by the De La Torre-

Mondragon method the preoperative examination included: general clinical tests, fecal dysbacteriosis, coprogram, irrigoscopy, full-layer biopsy of the rectum (in 2 cases), fibro-esophagogastroduodenoscopy, ultrasound examination of the abdominal cavity organs, ultrasound examination of the heart, brain, examination of the gastroenterologist, neurologist. According to the survey, all children were diagnosed with Hirschsprung's disease with a preliminary picture of the prevalence of aganglionosis zone. The following forms were met among 10 children: rectal - 2 cases; recto-sigmoid - 8.

The complex of preoperative preparation included: assessment of hypotrophy and correction of nutritive status, correction of revealed hemostasis disorders, thorough sanitation and cleansing of the intestines with purifying and siphon enemas, selective decontamination of the intestine with orally administered antimicrobial agents.

All 10 children underwent transanal endorectal reduction of the colon with superposition of a colanal anastomosis. The essence of the operation was as follows: a minimally invasive approach based on transanal endorectal mobilization and reduction of the

aganglionic part of the colon with its resection and formation of a coloanal anastomosis was used. On the operating table, the child was in the lithotomy position on the back with the perineum raised on the platen, the lower extremities dilated and fixed to the posts. Divulsion of the anus was carried with the rectal mirror, on the rectal mucosa 1.5 cm above the scallop line and the skin of the near-anal region was superimposed with 8 provisional seams for better exposure of the anorectal zone. When tying such seam, an additional «protective» fold is formed, consisting of the wall of the mobile lower ampullar part of the large intestine in the top, and from the bottom - the perianal skin, which protects the internal sphincter from mechanical influences. The anal retractor of Denis-Brown was not used. The operation began with a circular dissection of the rectal mucosa by electrocoagulation above the dentate line by 0.5 cm, entered the submucosal layer. Several seams are applied to the proximal end of the incision of the mucous membrane, which were used for traction. Endorectal excretion was continued in the proximal direction, remaining in the submucosa layer proximally for 5-10 cm, depending on the age of the child. Upon reaching the peritoneum, the rectal muscle was dissected along the entire circumference and the full-ligated rectum and sigmoid colon was mobilized, stretching through the anus. In this case, the vessels of the rectum and sigmoid colon were dissected with the use of ligatures closer to the wall of the intestine. It allowed the distal part of the colon with the anorectal zone and the enlarged site to be freely lowered to the healthy intestine. Aganglionic and dilated colon cuts were cut off, the sigmoid colon was additionally fixed to the muscular case of the rectum and coloanal anastomosis was formed for 0.5 cm above the dentate line by suturing the mucosa in the region of the scallop line to the wall of the inverted sigmoid colon. After that, the provisional seams were cut, which immediately led to the immersion of the anastomosis zone in the lumen of the intestine.

RESULTS AND DISCUSSION

There were no intraoperative complications and no lethality. Blood transfusion was not required in any case. The duration of the operation was 75-120 minutes (an average of 95 minutes). The length of the disrupted pathological area of the intestine was from 25 to 75 cm. In the near postoperative period, the

children observed bed rest for 8-10 days, enteral load began in 48-72 hours with therapeutic enteric nutritional mixtures with the transition to the general table by 5-6 days, prolonged epidural anesthesia for 72 hours was carried out. On the 12th day, a finger examination of the rectum was performed. The anastomosis phenomena in 2 patients were stopped by the appointment of physiotherapy procedures, rectal suppositories. There were no indications for bougie anastomosis. The patients were discharged on 12-14 days after surgical treatment. Most children are examined in a catamnesis, the observation period is more than 2 years. The quality of life satisfies patients and their parents. Children do not complain, have a regular independent stool, sometimes in 1-2 days. They develop according to the age. They have courses of complex proctologic rehabilitation 2 times a year (physiological treatment, massage, exercise therapy, appointment of the gastroenterologist).

A comparative assessment of the outcome of radical surgery at Hirschsprung's disease by Duhamel and Soave methods in 1991–2011 showed that post-operative peritoneal proctoplasty in postoperative period was associated with complications in 10 patients (31.2%): postoperative peritonitis in 4 (12%), encopresis in 2 (6.25%), «residual» aganglionosis zone in 2 (6.25%), 1 case of recto-vesicular anastomosis and stenosis of the «velum». 3 patients died (lethality 9%) - 2 children in the early postoperative period after multiple operations for severe adhesions; 1 child in the late postoperative period after total colectomy and ileo-rectal anastomosis performed at the age of 3 months with the total form of congenital aganglionosis of the colon died in the district due to uncorrected excoecosis on the background of enterocolitis.

CONCLUSION

Thus, the method of transanal endorectal resection of the colon in rectal and recto-sigmoid forms of Hirschsprung's disease according to De La Torre-Mondragon combines radicality and minimal traumatism in the surgical treatment of colon aganglionosis in children. The method is simple, safe, accompanied by a minimum number of complications, it allows to achieve excellent functional and cosmetic results in the near and distant postoperative period. The method is effective in children of any age in the most frequent forms of

aganglionosis, except for cases of total and subtotal lesion of the colon. The positive aspects of this technique, unlike traditional operations by Duhamel and Soave methods, include the possibility of early enteral feeding, minimal trauma in the mobilization of the intestine, and a minimal risk of damage to important pelvic structures, absolute «cosmeticity», no adhesion in the abdominal cavity, and a significant reduction in hospitalization.

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THE IMPROVEMENT OF CLINICAL AND FUNCTIONAL RESULTS OF SURGICAL CORRECTION OF PECTUS EXCAVATUM IN CHILDREN AND ADOLESCENTS

ABSTRACT

The article reflects the relevance of the problem of surgical treatment of pectus excavatum (PE) in children; a comparative analysis of surgical treatment of patients with PE is presented, major part of which was operated by the Nuss-procedure method. The main advantages of this method, aimed at reducing intraoperative and postoperative complications, contributing to the reduction of the period of complete rehabilitation of the patient, are distinguished.

Keywords: children, pectus excavatum, the Nuss thoracoplasty, complications.

INTRODUCTION

Pectus excavatum is a severe dysplastic malformation of the connective tissue of the sternocostal complex [1]. The frequency of this defect, according to domestic authors, varies from 0.6 to 2.3%, according to foreign authors varies depending on the region from 0.2 to 1.3%. Traditionally, the indications for surgical correction are functional disturbances of respiratory and cardiovascular systems, the intensity of which are directly related to the degree of deformation [2, 3]. In adolescence, the leading factor is psychoemotional one, a complex of physical inferiority, which makes one consult a doctor to correct this defect. More than 50 variants of deformation correction have been proposed, most of the generally accepted surgical procedures give good functional results, but they do not completely solve such existing problems as minimally invasiveness, radicalism and cosmeticity. According to the literature postoperative complications, relapse of deformity in children occur in 15-25% of cases. This problem remains urgent and requires further solutions.

In 1998 a surgeon Donald Nuss published a 10-year experience in treating pectus excavatum in children, calling his method as a minimally invasive technique for correction of congenital deformity of the chest [6]. A new approach involves the correction of a deformed sternocostal complex without resection of the costal cartilages and sternotomy. The method is widely used in pediatric surgeons around the world. Since 2009, our clinic has

been using the «Nuss-procedure».

MATERIALS AND METHODS OF RESEARCH

For the period from 2009 to 2017 in the surgical department of the Pediatric Center of the Republican Hospital No. 1 of the National Center of Medicine in Yakutsk sternochondrodistractio by Nassau was performed for 65 patients in treating pectus excavatum (Table 1).

The majority of patients (63%) were boys. In 56% of cases, the operation was performed at the age of 9 to 14 years. By the degree of deformation of the chest: 40 patients had 3dgrade deformity (61.5%), other 25 children had deformation of the 2nd degree according to Gizhitskaya. In addition, 8 children (12.3%) had an asymmetric deformation at pectus excavatum. Marfan-like syndrome was found in 10% of patients with pectus excavatum, these children were diagnosed with small heart anomalies, signs of disrupted maturation of connective tissue (arachnodactyly, platypodia, carriage disorders). In a complex of preoperative examination, along with conventional methods, chest X-ray in two projections, echocardiogram, according to the indications consultations of cardiologist and genetics were

included.

Support plates of titanium alloy BT6, size V-240T up to V-360T (JSC «KIMPF»), width from 15 mm to 20 mm, thickness from 1.7 mm to 2.8 mm and special guide (JSC «KIMPF») were used. The size of the plate was selected beforehand in advance, taking into account the age and dimensions of the child's chest. The shape of the plate bending was formed individually with the technician of the operating unit, depending on the type and degree of deformation. The operation was performed under combined endotracheal anesthesia in combination with epidural anesthesia. The technique of the operation was as follows: the cuts of the skin were made on the axillary lines from both sides, focusing on the deepest point of the funnel-shaped deformation. Under the pectoral muscles along the corresponding intercostal space a tunnel was formed with a help of a special guide. Further from left to the right a supporting titanium plate was carried and rotated 180 degrees, then it was fixed to the corresponding underlying ribs on both sides.

RESULTS AND DISCUSSION

Intraoperative correction of expressed deformity of the chest was achieved in all

Table 1

Distribution of children by age and gender, abs.number (%)

Gender	Age, years					All ages
	4 – 5	6 – 8	9 – 11	12 – 14	15 – 16	
boys	6	8	13	9	5	41 (63)
girls	3	4	7	8	2	24 (37)
total	9 (138)	12 (184)	20 (307)	17 (261)	7 (107)	65 (100)

Table 2

Comparative characteristics of thoracoplasty technique

Procedure	Mean duration of operation, min	Complications, %	Duration of anesthesia, days	Displacement of plate, %	Bed days	Relapse, %
Paltia	120	35	8 – 12	20	22	12
Nass	35	6	5 – 7	-	10	-

children. The duration of the operation was from 25 to 55 minutes (an average of 35 minutes). Transfusions of blood and blood products during operations were not required in any case. The children were in the intensive care unit. Medication therapy included antibacterial, hemostatic therapy, analgesia with non-narcotic analgesics and epidural blockade for 48-72 hours. In connection with the specific operation, the pressure caused by the plate is much greater than with standard thoracoplasties. It causes a full-blown pain syndrome in the early postoperative period. The introduction of extended epidural anesthesia allows children not to feel pain and avoid prescribing narcotic analgesics. Epidural anesthesia has been used in our clinic since 2013 and the effectiveness of this type of anesthesia has been clinically proven.

Postoperative complication in the form of pneumothorax was observed in 4 cases, which were 6%. Purulent-inflammatory complications, postoperative bleedings were not revealed. In the literature, cases of damage to the mediastinal organs during the «blind» plate, including the wound of the heart, are described. In connection with it many surgeons performed the stages of the formation of the median tunnel and the conducting of the plate under the control of a videothoracoscopy [4, 5]. As the experience of the leading clinics shows [2], the formation of the tunnel from left to the right is the safest, since in this way the tool does not rest on the heart, but goes along the tangent. We did not use videothoroscopic control when conducting the plate.

In all cases correction of deformation was achieved, an excellent functional and cosmetic result was obtained in 92% of the operated children. The duration of inpatient treatment averaged 10 bed-days. After discharge, we recommended physical training, swimming. We prohibited the practice of jumping sports and wrestling. Plates were removed after 3 years, migration and displacement of metal structures were not detected. Removal of the plate did not cause complications.

Until 2009, in our clinic in the treatment of pectus excavatum thoracoplasty by Paltia was used. The duration of the operation was on average 120 minutes, accompanied by severe blood loss and in 90% of cases there was a need for blood transfusion. Complications in the form of bleeding or pneumothorax were observed in 35% of cases. The duration of hospitalization was 20-25 days. In the

long term, in 20% of cases, migration of the plate was observed, which required the re-installation of metal structures. In 12% of cases, in the long term after a removal of the plate, a relapse of the deformation of sternocostal complex was detected.

Comparative evaluation of operations (Table No. 2) revealed the advantages of Nass's procedure, namely:

1. Minimal trauma;
2. Uncomplicated postoperative period;
3. The best cosmetic result.

Thus, the correction of pectus excavatum by the Nass method allows to obtain the best cosmetic and functional result and it is the method of choice.

CONCLUSIONS

1. Sternochondrodistraction by Nass method is an effective safest method for eliminating pectus excavatum in children.
2. The majority of patients (92%) have an excellent functional and cosmetic result.
3. In 5% of cases there were complications in the early postoperative period in the form of pneumothorax due to injury of the parietal pleura during the intervention.
4. The use of epidural anesthesia effectively reduces pain syndrome in the early postoperative period.

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A.Z. Mestnikova, I.I. Gogolev

CLINICAL CASE OF LATENT MASTOIDITIS

ABSTRACT

We presented our own clinical observation of a latent mastoiditis. The girl of 11 years old addressed with complaints of pain in the left ear. This clinical observation substantiates the need for timely diagnosis and surgical treatment of mastoiditis. This example shows that despite the erased clinical picture: normal indices of audiometry, tympanometry and a healthy otoscopic picture, the destructive process in the mastoid process is progressing. Consequently, the leading indicator that determines the tactics of management is considered to be the existence of destructive changes on the part of the structures of the middle ear. Therefore, with a protracted flow of otitis media for more than 14 days, a CT scan of the temporal bone is indicated.

Keywords: mastoiditis, CT of temporal bones, anthromastoidotomy.

INTRODUCTION

One of the most frequent complications that occur in the pathology of the middle ear is mastoiditis, which is a destructive process of the bone structures of the cells of the mastoid process [1, 3, 5]. In modern times, in view of the appointment of antibiotic therapy, the classical picture of mastoiditis is blurred, which sometimes causes doctors to take delayed measures of treatment of this disease [2, 4, 6].

This article presents a case of latent mastoiditis.

The girl of 11 years old addressed with complaints of pain in the left ear. From an anamnesis: 3 months ago there was a pain in the right ear, the otorhinolaryngologist diagnosed with acute right-sided catarrhal otitis media, the patient took antibacterial therapy courses in the form of sumamed 3 days, no improvement occurred, purulent discharge from the right ear appeared. With the otoscopic picture, the microperforation of the tympanic membrane was revealed and the diagnosis of acute purulent otitis media was established, a course of amoxicillin 10 days was prescribed and local treatment with otophas.

Against the background of the treatment, the purulent discharge stopped, the hearing improved. However, after 2 weeks there was a moderate pain in the ear to the right of the hearing impairment the patient did not notice, there was no rhinitis, the antibacterial drug suprax was prescribed by the mother independently for 10 days. During the month the patient did not notice any problems with the ears. Then there was a pain in the ear and the BTE area on the left. The CT of temporal bones was assigned as an otorhinolaryngologist, on the series of CT sections: on the right: the structure of the mastoid process of the pneumatic type, the cells and antrum are normally developed. The pneumatization of cells of the mastoid process is reduced. The destruction of the upper-external wall of the mastoid process is reduced. The destruction of the sigmoid sinus are determined. Left: the

structure of the mastoid process of the pneumatic type, the cells and antrum are developed normally, the pneumatization of the cells of the mastoid process and the drum cavity is partially reduced. Bone destruction is not revealed.

The patient is referred to an otorhinolaryngologist consultation. At otorhinolaryngological examination it was revealed: nasal breathing free, mucous membrane pink, not edematous, septum of nose along the middle line. Adenoides of the 1st degree. Mucous pharynx pink, a condition after a tonsillectomy. Right ear: in the behind-eye region in the cortical layer of the mastoid process in the antrum projection, a bone defect $d = 0.5$ cm, slightly painful upon palpation, is determined. The tympanic membrane is gray, the identification contours are clearly visualized. The auditory tube is passable. Rumor according to the audiogram is normal.

According to the tympanogram type «A». Left ear: in the behind-eye region, an enlarged lymph node $d = 0.5$ cm is moderately painful on palpation, the tympanic membrane is pink, cloudy, contours are smoothed. The auditory tube is passable. According to the tympanogram type «C». Was diagnosed: Acute left-sided catarrhal median otitis media. Latent mastoiditis on the right. A decision has been made for the operative management of the patient in the volume of

antibacterial therapy - ceftriaxone.

The bone defect of the cortical layer under Linea temporalis was removed intraoperatively 0.5 cm from spina Genle. In the course of an antrum, cells of the mastoid process in the form of a sugar bone, granulation tissue is determined in the cells, which is taken for histological examination. Antrum was opened, granulation tissue was found blocking the entrance to the antrum, the entrance was expanded. Postoperative wound partially closed.

In the postoperative period, the wound healed by secondary tension for 5 days. The child received a course of antibacterial therapy (ceftriaxone 1.0 g once a day for 8 days). According to the

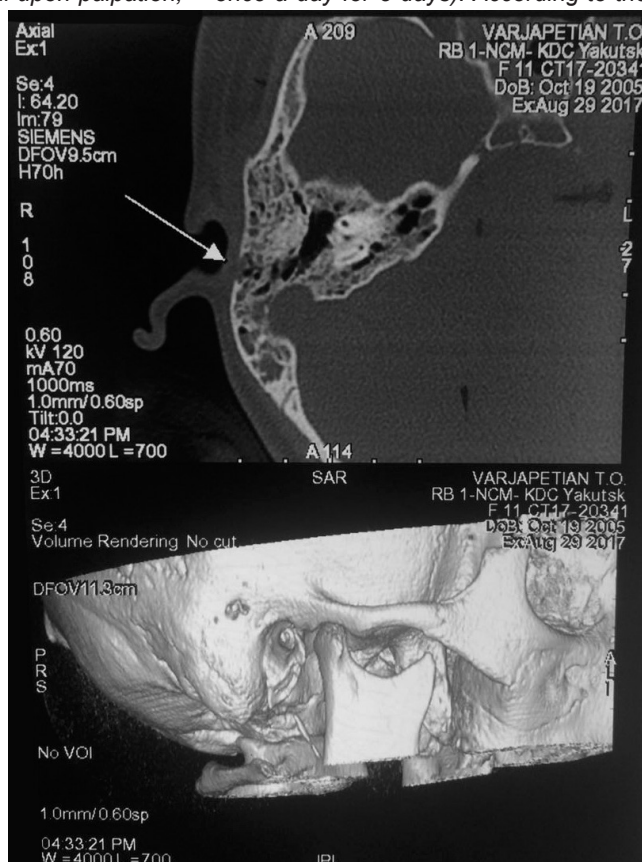


Fig. 1. CT-picture of destruction of the cortical layer of the mastoid process.

of audiogram hearing is normal. According to the histological conclusion: granulation



Fig. 2. Intraoperative pattern of destruction of the cortical layer of the mastoid process.

tissue. The patient was discharged on the 7th day.

DISCUSSION

This example shows that despite the erased clinical picture: normal indices of audiometry, tympanometry and a healthy otoscopic picture, the destructive process in the mastoid process is progressing. Consequently, the leading indicator that

determines the tactics of management is considered to be the existence of destructive changes on the part of the structures of the middle ear. Therefore, with a protracted flow of otitis media for more than 14 days, a CT scan of the temporal bone is indicated.

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CLINICAL CHARACTERISTIC OF THE CONCOMITANT SOMATIC DISEASES AMONG CHILDREN WITH CONGENITAL CLEFTS OF THE UPPER LIP AND PALATE IN THE REPUBLIC OF SAKHA (YAKUTIA)

Abstract

Today congenital malformation of maxillofacial area is a current medical-social problem. At the same time the existence of accompanying general diseases have a particular negative impact on the results of treatment, rehabilitation and prophylaxis. Taking it into account our research was devoted to the structure of pathological processes of organs and systems at children with congenital clefts of the upper lip and palate living in severe climatic conditions of Yakutia. The received results testify about a wide range of somatic diseases and pathologies connected with dysembryogenesis. So, damages of the central nervous system were revealed in their structure which included residual-organic and hypoxemic-ischemic damages, a delay of psycho-speech development, syndromes of movement disorders, hyper excitement and asthenic mental retardation, neuromuscular wryneck, epilepsy and cerebral palsy. Further frequent congenital defects of cardiovascular system at the examined groups of children were presented by open foramen ovale, defects of interventricular and interatrial septum, open arterial canals, Fallot's tetralogy and also other congenital heart diseases. The following most widespread accompanying pathologies are eyes diseases and they were presented by hypermetropia or myopia, stenosis of lacrimonasal canal and strabismus and also anophthalmia, dacryocystitis, astigmatism, keratopathy, congenital eyelid ptosis and cataract. Besides, the examined children with congenital clefts of the upper lip and palate had such disease as atopic dermatitis.

Besides, there were also diseases of external and inner ear where this group of diseases included bradyacousia and also anomalies of auricle development. Meanwhile, diseases of kidneys and urinary tract, inguinal, umbilical, inguinoscrotal hernias, benign neoplasms, anomalies of the development of extremities, anus atresia, chronic hepatitis C, malignant diseases of blood. At the same time, during the experiment there were some cases of diagnosis of hypertrophic rhinitis, diseases of salivary glands, rickets, accessory teeth, slanting facial cleft, chromosomal pathology, bronchopulmonary dysplasia, pylorostenosis, talipes, epithelial coccygeal course and various endocrine disorders.

The received results characterize the relevance of associated diseases at children with congenital clefts of the upper lip and/or palate. This situation needs further research with the development and deployment of the complex program of medical-social rehabilitation of congenital malformation of maxillofacial area and their prophylaxis among children living in conditions of high latitudes.

Keywords: congenital cleft of the upper lip and/or palate, accompanying pathology, anomalies of development of other organs and systems, treatment, medical-social rehabilitation, prophylaxis of congenital malformation.

INTRODUCTION

Today congenital malformation of maxillofacial area is a current medical-social problem. Despite broad studying of congenital clefts of the upper lip and palate, the problems of their treatment and prophylaxis remain not to be solved [3, 6, 7]. At the same time common condition of an organism and concomitant somatic diseases influence on the results of treatment-and-prophylactic actions among children with congenital malformation of maxillofacial area [1, 5, 8]. Taking it into account we devoted our research to studying of somatic diseases at children with congenital anomalies of face and facial skeleton [2, 4]. The received results testify about a wide range of somatic diseases and pathologies connected with dysembriogenesis. Similar researches in the conditions of the region have not been conducted earlier.

Materials and research methods. The retrospective and prospective analysis of case histories on the basis of children's maxillofacial surgery of otorhinolaryngological department of Republic hospital №1 – National center of medicine» was carried out. Case records of 191 children aged from 2 months up to 14 years and teenagers up to 18 years during 2013-2017 were analyzed. There were 92 boys and 99 girls. All children were operated concerning congenital clefts of the upper lip and palate. They took a medical-social rehabilitation course at the hospital and were included in the unified database. We took data from case histories into account considering the existence of accompanying somatic diseases which represented their wide range.

Statistical data processing of the research was carried out by standard methods of variative statistics with average calculation, mean squared mistake by means of packages of the application programs «Microsoft Excel» 2009 (Microsoft Corporation, 2000-2016). The received results were grouped in a set of identical signs.

RESULTS AND DISCUSSION

The carried-out analysis and assessment of the received results characterize the existence of particular concomitant somatic diseases in children with congenital clefts of the upper lip and/or palate. So, damages of the central nervous system ($34.55 \pm 0.86\%$) were in their structure which were presented by residual and organic damages ($17.83 \pm 1.16\%$), hypoxemic - ischemic damages, a delay of psycho-speech development ($6.28 \pm 1.23\%$), a syndrome

of movement disorders ($2.61 \pm 1.31\%$), hyper excitement and asthenic syndrome ($2.09 \pm 1.29\%$), and also mental retardation, a neuromuscular wryneck, epilepsy and cerebral palsy ($0.52 \pm 1.31\%$). Further by frequency there are congenital defects of cardiovascular system ($21.98 \pm 1.03\%$), open foramen ovale ($8.39 \pm 1.21\%$), defect of interventricular and interatrial septum ($7.33 \pm 1.22\%$), open arterial duct ($2.61 \pm 1.31\%$), Fallot's tetralogy of ($1.04 \pm 1.30\%$) and also the other congenital heart diseases ($2.61 \pm 1.31\%$).

It should be noted that the following most widespread accompanying pathologies are diseases of eyes ($14.61 \pm 1.16\%$) which consisted of the following diseases: $4.18 \pm 1.26\%$ hypermetropia or myopia, $2.09 \pm 1.29\%$ stenosis of the lacrimonasal canal, strabismus and anophthalmia made $1.57 \pm 1.30\%$. At the same time $1.04 \pm 1.30\%$ of cases were dacryocystitis, astigmatism, keratopathy, congenital eyelid ptosis where the indicator of cataract was $0.52 \pm 1.31\%$. Besides, the examined groups of children ($6.28 \pm 1.23\%$) with congenital clefts of the upper lip and palate had such disease as atopic dermatitis.

Except the mentioned above associated diseases at children with congenital malformation of maxillofacial area there diseases of external and inner ear were revealed ($5.75 \pm 1.24\%$). This group of diseases included bradycardia ($3.14 \pm 1.28\%$) and also anomalies of development of an auricle ($2.61 \pm 1.28\%$). The abundance of diseases of kidneys and urinary tract was in limits of digital values ($4.68 \pm 1.25\%$). There were hypoplasia of kidneys, cryptorchism, phimosis of $1.04 \pm 1.30\%$, ureterohydronephrosis, hypoplasias of testicle, pyelectasia were $0.52 \pm 1.31\%$. Meanwhile, the frequency of inguinal, umbilical, inguinoscrotal hernias was $3.14 \pm 1.28\%$, and data of various forms of benign neoplasm were at the level of $2.61 \pm 1.28\%$. At the same time anomalies of development of extremities, such as aplasia of the top extremities, camptodactylia and syndactylia ($1.57 \pm 1.30\%$) were found at children with congenital clefts of the upper lip and/or palate.

It should be noted that there were less cases of anus atresia, chronic hepatitis C, malignant diseases of blood ($1.04 \pm 1.30\%$) among the examined groups of children. At the same time, hypertrophic rhinitis, diseases of salivary glands rickets, accessory teeth, slanting facial cleft, chromosomal pathology, bronchopulmonary dysplasia, pylorostenosis, talipes, epithelial

coccygeal course which was respectively seldom $0.52 \pm 1.31\%$. Besides, children were diagnosed endocrine disorders of $2.61 \pm 1.28\%$, nanism of $1.05 \pm 1.30\%$, hyperthyroidism, hypogonadism and goiter of $0.52 \pm 1.31\%$.

CONCLUSION

The received results demonstrate the prevalence of various forms of associated diseases at children with congenital clefts of the upper lip and/or palate where some combination of several pathologies was defined.

This situation has a negative impact on quality and timely performing treatment that needs further research with the development and deployment of the complex program of medical-social rehabilitation of congenital malformation of maxillofacial area and their prophylaxis among children living in severe climate conditions of Yakutia.

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QUALITY OF LIFE OF PATIENTS WITH PECTUS EXCAVATUM

ABSTRACT

The purpose of the work was to evaluate life quality in children after pectus excavatum operation in the remote periods.

The main operational methods included surgery by the Nuss and Ravich method. According to the results of the research conducted on the basis of the SF36 questionnaire we proved the high effectiveness of surgical treatment in children with pectus excavatum II-III stages. And also we proved the significant importance of the selected method of surgical treatment.

Keywords: quality of life, pectus excavatum, physical functioning, social functioning.

INTRODUCTION

Recently, there are few works devoted to the evaluation of the psycho-social importance of correctional operations in orthopedic pathology, including the deformation of the chest.

Pectus excavatum - deformation of the chest (PE) - according to the literature, it accounts for 91% of all congenital deformations of the chest, the frequency of occurrence of PE varies from 0.06 to 2.3% in population. Pathogenesis is still unknown, but according to modern theories, primarily this disease is a manifestation of the connective tissue dysplasia syndrome and is caused by disorders in the synthesis at the genetic level [5, 6]. It is assumed that the cause of formation of PE is the dyschondrogenesis of hyaline costal cartilage, leading to advancing growth of the ribs and, as a consequence, sternal insertion into the chest [7].

The progress of medical technologies and the accumulated experience of surgical treatment of chest deformities did not lead to a unified opinion, approach, and the type of surgical treatment [6].

The issues of early and full rehabilitation and adaptation of patients, after surgical treatment, are also relevant, they are important both individually for each patient and socially for modern society. After all, it is the active social group of people, specifically young men aged from 14 to 25 (59.09% of the total number of patients), of population who are able to work, appeal to a specialist about this disease and are in need of surgical treatment, due to a decrease in normal physical activity and working ability [5,6,10].

MATERIALS AND RESEARCH METHODS

The study is based on the analysis of the separated results of surgical

treatment of 78 patients with funnel-shaped deformation of the chest, for 8-year period, who were undergoing treatment in the children's surgical department of the 1FSBI «CCH with clinic» AP RF and Regional center of pediatric surgery of Krasnoyarsk RF.

The distribution of patients included in the study was performed according to the type of surgical treatment. Group I comprised of 59 patients operated according to the Nuss method at the age from 7 to 18 years, group II consisted of 19 patients operated according to the Ravich method, at the age from 14 to 18 years. In this work, the classification of PE by V.K. Urmonas (1975) was used. It takes into account the degree of deformity, shape and stage of the disease [5] (table 1).

The distribution of patients by age groups, degree of funnel-shaped deformation of the chest and the type of

surgical treatment are presented below (Table №. 1).

The patients in adolescent age with a third degree of deformity of the chest (79.48%) were in prevailing number. 2.5% of cases of patients with PE were secondary, as a result of mid thoracotomy, children were operated during the neonatal period, in 97.5% of cases, PE was a congenital malformation of the chest, manifested in different ages - from 4 years and older. With the relapse of PE there were 2 patients who manifested themselves during the first 2 years after the operation by Ravitch. In 1 case, the relapse was observed after the minimally invasive thoracoplasty according to Nuss, associated with the early removal of the plate, 2 years later, at the age of 16 years. Primary thoracoplasties in all cases were performed in other medical institutions.

Concerning the surgical treatment, earlier, thoracoplasty in patients with PE was performed according to the Ravitch method, which, despite its effectiveness, was extremely traumatic for patients and was accompanied by a pronounced cosmetic defect. The risk of relapse for this type of surgical treatment is often high [6].

Today we use only the Nuss method, both genuine and in author's modification. The plate is held retrosternally, from side mini-passages, under optical or manual control, which reduces operational risks and traumatism. The time of surgery is reduced and allows to carry out early vertical adjustment and rehabilitation of patients. And in sufficient periods of stabilization (the period of plate standing up to 4 years) excludes the relapses to single cases [4].

The main tools for assessing the quality of life are questionnaires. One of the widely used common questionnaires is the short form Medical Outcomes Study Short Form (SF-36), developed by J. E. Ware et al. in 1988 [2, 3, 11].

The SF-36 questionnaire (Engl. The Short Form-36) is a nonspecific questionnaire for assessing the quality of life of a patient, widely used in researches of quality of life in Europe and the United States. The questionnaire reflects the general well-being and the degree of satisfaction with those aspects of human life that are affected by the state of health [8,9].

SF-36 consists of 36 questions, grouped into eight scales: physical functioning (RF), role activity (RP), physical pain (BP), general health (GH), vitality (VT), social functioning (SF), emotional state (RE) and mental health

(MH), as well as an assessment of well-being compared to last year (HH). The indicators of each scale are designed in such a way that the higher the value of the indicator (from 0 to 100), the better the score on the selected scale. Of these, two parameters are formed: the psychological and physical components of health.

To create a comparative scale of evaluation of instrumental research methods data and clinical data, a comparison group was compiled from 25 children aged 12 to 18 years without the pathology of the skeleton of the chest and thoracic cavity (Table 2).

Table 2 also shows the data of clinical manifestations, the complex symptoms, of patients with FDC depending on the degree of deformation, in a comparative position with the control group of «healthy» children in this nosology.

Thus, patients with deformity of II grade had complaints of frequent respiratory diseases, increased fatigue and dyspnoea during physical exertion. In third degree of deformity, children were complaining of irregular heart rhythm and pain behind the sternum.

As for the survey itself, we used the Russian version of the SF-36 questionnaire.

The survey was conducted using a telephone interview, a written questionnaire and an interactive on-line

questionnaire. The obtained data was subjected to statistical processing with the calculation of the reliability of the differences.

RESULTS AND DISCUSSION

The healthy children we examined showed high physical activity, which was close to the maximum possible evaluation, what in comparison with the data of children with a PE before the operation, 47.6 ± 2.04 were quite contrasting indicators (Table 3).

Analysis of the quality of life parameters of children with PE before surgery and healthy children of different age groups showed statistically significant differences ($p < 0.05$) in all scales of the SF-36 questionnaire. Our study showed that aspects like RF were most affected, which was reduced to 47.6 ± 2.04 before the operation, which is almost 2 times lower compared to the control group (98.5 ± 1.06). We have found that children with PE in comparison with conditionally healthy children, it is more difficult to lead an active lifestyle. Reflecting this state, the SF index has been reduced to 41.7 ± 2.8 .

The possibility of communicating with peers, social adaptation in young children is provided by role functioning. Frequent (sometimes long-lasting) absenteeism in educational institutions, with frequent respiratory diseases, chest pain, dyspnoea - were 4-5 times more likely to

Table 1

The distribution of patients by age groups, the degree of chest deformity and type of surgical treatment, abs.number, %

Age	II stage		III stage		Total
	Group I	Group II	Group I	Group II	
School, 7-11 years	5 (6,4)	-	10 (12,82)	-	15(19,24)
Adolescent, 12-18 years	9 (11,5)	2 (2,5)	35 (44,87)	17 (21,79)	63 (80,76)
Total	14 (17,94)	2 (2,5)	45 (57,69)	17 (21,79)	78

Table 2

The frequency of clinical manifestations in children with PE depending on the degree of deformation of the thorax (n=78) considering the control group (n=25)

Complaints	Control group (n=25)		Дети с ВДГК			
			II degree (n=16)		III degree (n=62)	
	abs.	%	abs.	%	abs.	%
Frequent respiratory infections	2	8	12	15,3	30	38,46
Fatigue, weakness	2	8	7	8,97	44	56,4
Dyspnea on exertion	3	12	13	16,66	32	41
Abnormal heart rhythm	-		2	2,5	7	8,9
Pain in heart and chest	-		5	6,9	9	11,5

develop in patients with PE, in contrast to the children of the control group - excluding children from the active lifestyle of the collective, which contributes to the formation of social dysadaptation. In the study of role functioning (RP), when analyzing the obtained data, regardless of age, it was found that children with PE ($RP - 40.7 \pm 5.29$), compared with conditionally healthy children ($RP - 96.3 \pm 2.3$), had difficulties in completing assignments at school, skipping classes due to poor health or in need to visit a doctor.

In much less degree the decrease in parameters of RE was noted - by 25% in the study groups before the operation (67.2 ± 4.87), when compared with the control group (92.2 ± 11.8). During the analysis of obtained data, it was found that, regardless of age, children with PE, compared with healthy peers, are more likely to experience a feeling of fear, anger, dejection or sadness, restless sleep.

The overall quality of life score was significantly different from that in the control group, in the clinical group (before surgery) the decrease of it by 30.1-30.6%, ($p < 0.05$) was noted. However, there were no significant differences before the operation between two groups.

In analyzing the parents' answers, the same results were obtained. So, in their opinion, the quality of life of children with PE, before surgery in both study groups was significantly lower than in peers of the control group, in all constituent aspects ($p < 0.05$). At the same time, all parameters were reduced evenly.

The indicators of general health perception (GH) and emotional ability to engage in the usual activities (RE) in children before the operation fluctuated within a sufficiently low level, despite the active adolescence period, and were 49.9 ± 2.03 and 67.2 ± 4 , 87 points respectively.

Thus, the quality of life in children with PE before the operation was significantly reduced, in all scales of the SF-36 questionnaire and indicators of clinical and instrumental examination. They have acute decreasing in physical and social activity, the emotional status is falling, subjective estimations of an emotional condition, mood and, as a whole, the general state of health are considerably lowered. Thus, the quality of life in children with PE before the operation was significantly reduced, in all scales of the SF-36 questionnaire and indicators of clinical and instrumental examination. At them physical and social activity sharply decreases, the emotional status falls,

subjective estimations of an emotional condition, mood and, as a whole, the general state of health are considerably lowered. The SF-36 questionnaire proved to be a highly sensitive tool for analyzing the decrease in the quality of life of children with these diseases, since it also reveals such evaluation criteria as the patient's psycho-emotional status that often does not play a big role, either for parents or for doctors when deciding of the operational treatment, often such patients are quite self-loathing and feel «outcast» in the school environment because of this defect.

When comparing the two types of surgical treatment, a significant difference in the groups was also obtained. In Table 3, in groups I and II, data from a questionnaire conducted in one year after operation is presented.

Thus, comparing the indicators before and after the operation, it is possible to identify the fact that, indices that reflects the physical statement (RF, RP, BP, VT, CH) increased in group I by 40-50%, compared with preoperative indicators, indexes that reflects the psychological statement (GH, SF, RE, MH) in this group increased by 30-40% and amounted to an average of 87.65 ± 3.17 points.

In group II, the indices that reflects the physical statement (RF, RP, BP, VT, CH) did not make such a significant difference (70.1 ± 3.4), compared to the preoperative indices, the average gain for these indices was from 15 to 20%. This statistic was also observed in indices that reflects the psychological statement of patients (GH, SF, RE, MH).

Attention is drawn to one of the indices that reflects directly the very operative intervention - physical pain (BP) - in patients of the first group this indicator

was 88.5 ± 4.09 , and in the second group 64.4 ± 3.31 . That, in the opinion of the patients themselves (in 84.2% of cases), is caused by aching pains in the chest area during the formation of a correct posture (extension of the shoulder girdle and extension of the back), also a decrease in tactile sensitivity in the area of the operating scar is noted. In group I, patients in 17% of cases note a bursting feeling during deep inspiration and dilatation of the shoulder girdle, also in 8.5% of cases a feeling of discomfort in the area of fixation of the plate (on the lateral surface of the chest) during a prolonged position on the side, during the night sleep is noted.

Thus, in the comparative analysis of the results of the operative intervention according to Ravich and Nuss, already 1 year after the operation, based on the opinions of the respondents, significant differences between the groups were found. The quality of life of children of the first group was significantly higher than that of the second as in the general score, and in the aspects of physical, social and role functioning ($p \leq 0.05$).

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Table 3

The quality of life in healthy children and children operated on Pectus excavatum

Scale	Control group (n = 25)			
		Before surgery (n=35)	Group I (n=59)	Group II (n = 19)
PF- Physical functioning	$98,5 \pm 1,06$	$47,6 \pm 2,04^*$	$94,3 \pm 3,16^*$	$81,5 \pm 3,13^*$
RP- role of physical problems in limiting life activity	$96,3 \pm 2,3$	$64,7 \pm 5,29^*$	$80,4 \pm 3,81^*$	$64,4 \pm 3,31^*$
BP- biological pain	$96,4 \pm 3,30$	$40,3 \pm 3,12^*$	$88,5 \pm 4,09^*$	$69,8 \pm 3,17^*$
GH- General perception of health	$95,4 \pm 5,40$	$49,9 \pm 2,03^*$	$88,9 \pm 2,03^*$	$77,5 \pm 4,05^*$
VT- vitality	$99,3 \pm 5,04$	$44,4 \pm 2,20^*$	$94,4 \pm 4,60^*$	$77,5 \pm 4,20^*$
SF- Social functioning	$90,0 \pm 8,60$	$41,7 \pm 2,8^*$	$86,7 \pm 2,8^*$	$76,7 \pm 3,1^*$
RE- The role of emotional problems in the restriction of vital activity	$92,2 \pm 11,8$	$67,2 \pm 4,87^*$	$88,6 \pm 3,43^*$	$70,2 \pm 3,81^*$
MH- Mental health	$90,2 \pm 6,28$	$40,3 \pm 1,60^*$	$86,4 \pm 2,76^*$	$79,6 \pm 2,36^*$
CH- comparison of health state with the previous year	$87,5 \pm 6,40$	$70,9 \pm 2,21^*$	$94,7 \pm 3,44^*$	$70,3 \pm 2,56^*$

Note. In groups I and II, data from a questionnaire conducted in one year after operation are presented, $*p < 0.001$.

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CLINICAL FEATURES OF THE MAIN TRAUMATIC INJURIES IN CHILDREN OF THE FIRST YEAR OF LIFE

ABSTRACT

The main types of traumatic injuries among children of the first year of life are birth and burn injury. Since the small age of the patients, inability of verbalizing complaints, the lack of precise staging of traumatic shock, low specificity of some symptoms of shock (for example, symptom of «white spots»), there is needing for an objective criteria's of the severity condition, which proved an appointment of the fluid therapy, analgesia.

The **purpose** of this study is to improve the quality of treatments children with a birth and a burn injury through comprehensive examination, taking into account not only the nature of the injury (type, location, area, depth of the lesion), but the degree of pain, clinical indicators of central hemodynamics, parameters of electrocardiogram (ECG). We examined 67 children with birth injuries at the age of 28 days of life (kefalohematoma, fractures of clavicles, humerus and femur) and 30 children with burn injury at the age of 1-12 months, were respectively treated at the Department of surgery for newborns and the burn unit Voronezh hospitals №1, №2. So, the children of the first year of life with traumatic injuries, in addition to the changes in special status, hemodynamic (decrease in blood pressure, tachycardia or bradycardia), had changes of ECG (shortening of RR intervals, QT, the increase in SP), NIPS scale, ultrasound of the brain and internal organs due to birth injury (periventricular edema and hypoxia; diffuse changes of kidneys, hemorrhage in the adrenal glands) and laboratory data (anemia, leukocytosis, compensated metabolic acidosis).

The presence of detected changes points to the need for a comprehensive examination of children first year of life with traumatic injuries. Treatment must be not only of special surgical treatment (puncture of cephalohematoma removed, immobilization; dressing, necrectomy and autografting for burns), and the designation of analgesia, infusion therapy.

Keywords: birth injury, burn injury, newborn, cardiovascular system, hemodynamics, electrocardiography, intensive care.

INTRODUCTION

According to Rosstat, in Russia there is a growth in the number of patients within the first year of life with injuries of different genesis (from 16.6 thousand in 2000 to 26.4 million in the late 2008) [1]. The main types of traumatic injuries in children of first year of life are birth and burn injury. Along with the special clinical manifestations of injury (local status), there is a need for objective criteria of severity, depending primarily on the functioning of the cardiovascular system. They can serve as indicators of blood

pressure (BP), heart rate (HR), severity of pain, the data of instrumental examination of the cardiovascular system. One of the public methods of investigation of cardiovascular system in children the first year of life is electrocardiography. Intervals, complexes, segments of the ECG correspond to the phases of the cardiac

cycle: atrial systole (tooth P); the systole of the ventricles (QRST complex); ventricular diastole (segment T-P) [2].

The research objective - to improve the efficiency of diagnosis and treatment

of traumatic injuries in children of first year of life.

MATERIAL AND METHODS

In the clinic of pediatric surgery (Voronezh hospitals №1, №2,) for the last 2 years we observed 67 children (29 girls and 38 boys) with birth injuries at the age of 28 days of life (group 1) and 30 children with burn injury (13 girls and 17 boys) aged 1 to 12 months (group 2). Upon admission to the surgical hospital, and within 3 days after hospitalization, was conducted by dynamic inspection systems, was measured blood pressure

(using a mechanical sphygmomanometer with cuffs of appropriate diameters), heart rate, hourly urine output was evaluated in the peripheral microcirculation, sonority and rhythm of heart sounds. Determined indicators for the NIPS scale (pain scale for newborns) [10], indicators of the general analysis of blood and urine, acid-base status, evaluated the results of ultrasound, radiography examinations. Then the recorded ECG in three standard leads, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6 (ECG recording was carried out upon admission to the hospital). Analysis of the data of central hemodynamics was carried out using descriptive statistics with the use of histograms [7].

THE RESULTS AND DISCUSSION

Group 1. Structure of birth trauma are presented by us to the following units [2, 5, 12]: a) cephalohematoma removed parietal areas and bilateral - 67%; b) closed fractures of the humerus - 12; c) closed fractures of the clavicle - 18; d) closed fractures of the femur - 3%.

When assessing the local status of children with cephalohematoma, the amount of subperiosteal hemorrhage 10 - 20 ml was observed in 16%, volumes 21-40 ml - 19%, volume more than 40 ml of 32%. All patients with fractures of the clavicle, humerus, femur, had the prevalent symptom of the limitations of movements; local edema in 3% of cases with fracture of the humerus, 3% of cases with femoral fracture; bone crepitus - 18% of children with fractures of the clavicle. Analysis of radiographs showed predominant localization of the fracture in the diaphysis of long bones and mixed. On spondylograms patients with birth trauma - 22% had concomitant dislocation of CII or CIII of the vertebral bodies.

According to ultrasound of the brain there were signs of hypoxia, periventricular edema, and 12 % - intraventricular hemorrhage. In one case, diagnosed the signs of periventricular leukomalacia. According to the ultrasound of the internal organs in 42% of cases showed diffuse changes of the kidneys and liver, 6% hemorrhage in the adrenal glands.

Analysis of the results of the scale NIPS showed that 22% of infants with trauma had experienced the pain of medium intensity (the values from 4 to 6 points), 8 % - severe pain (values from 7 to 10 points) and 70% mild pain (values from 0 to 3 points). In the group experiencing moderate to severe pain included patients with long bone fractures due to the strong and very strong nociceptive afferent impulses, the characteristic of

this type of fracture [6, 14].

Analysis of laboratory data revealed the presence of a distribution of leukocytes in 52% of cases, 4.5% - anemia mild. Proteinuria in 6% of patients may be related to traumatic damage to the muscle tissue and with the physiological condition of the neonatal period [3]. Compensated metabolic acidosis was observed in 11% of patients with long bone fractures and 6% with extensive cefalogematoma. Central hemodynamic parameters of patients were compared with accepted standards [3, 8, 9], which is shown in histogram 1.

As can be seen from the histogram 1, in 42% of infants with a birth injury, a decrease AD systolic (standard 60-80 mm Hg); deviations of AD diastolic was not (the norm of 30-50 mm Hg). The decrease in the heart rate less than 120 beats per minute (bradycardia) was observed in 4%, more than 160 beats per minute (tachycardia) in 33% of patients.

Reduction in hourly urine output and daily diuresis in newborns with trauma were noted. 37% of children showed pallor of the skin, combined with the «marbling», of which 14% with long bone fractures, 15% of fractures of the clavicles and 8% with cefalogematoma large volumes. 20% of patients auscultation was determined muted heart tones, of them all 15% with long bone fractures. Analysis of electrocardiograms revealed substantial changes, indicated in table 1. The figures obtained were compared with the standards proposed by some authors [1, 11, 13].

Group 2. The structure of burn injuries among children in the first year of life are presented: thermal burn boiling water - 67% of them I degree - 6 %, II degree

- 43%, III degree - 18%; contact burn (stove, iron) - 33%, second degree - 23 %, III degree - 10%. The area of damage in thermal burns with boiling water up to 5% - 75% of patients, 6-10% - 15%, over 10 % - 10% of children. The area of damage with contact burns in all patients of this group did not exceed 5%. The preferential localization of thermal burns by boiling water - the area of the foot (50%), brush (40%); the localized contact burns - the area of the hands (90%). Analysis of laboratory data showed the presence of mild anemia in 40%, leukocytosis in 20% of patients. A case of severe anemia (hemoglobin 65 g/l) was in one patient with a large area of destruction with boiling water (of the III degree burns, the area of 18%). Proteinuria was noted in two patients with great depth and affected area with boiling water (burns III degree, squares, 14% and 18%). The distribution of values of AD in children the first year of life with burn injury is illustrated in histogram 2.

As can be seen from the histogram 2., 20% of children with burn injury, a decrease AD systolic (standard of 85-100 mm Hg); AD diastolic deviation was registered only in one case (the norm of 40-60 mm Hg). Tachycardia exceeding 130 beats per minute was observed in 63%, bradycardia was not.

Reduction of hourly diuresis was observed in 6% of patients with III degree thermal burn with boiling water. The marked symptom of «white spots» for more than 3 seconds - 10% of patients; pallor of the skin in 23%. The change in the ECG of children first year of life with burn injury were shown in table 2.

Treatment of children the first year of life with a birth and a burn injury was

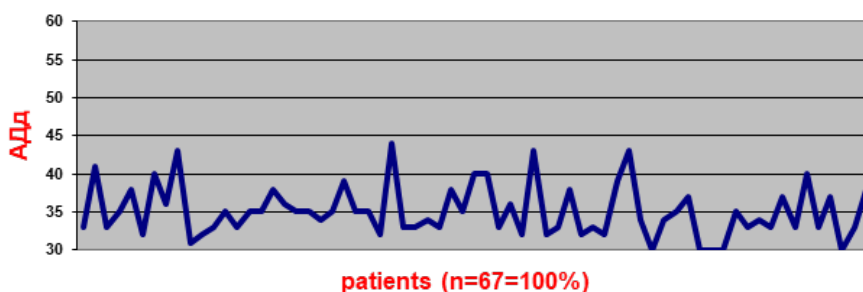


Fig. 1. The distribution of values of AD among newborns with birth trauma

Table 1

The change in the ECG of newborns with birth injury, %

Number of patients n=67 (100%)	ECG indicator						Increase of systolic index
	Deviation of EOS sharply to the right	↓ QRS	↑ QRS	↓ RR	↑ RR	↓ QT	
	21	12	46	50	11	55	
							92

Note: the symbol ↓ is a shortening, the symbol ↑ is the extension of the complex, intervals.

complex, given the diagnosed disorders of the cardiovascular system: special (surgical) and medication.

So, when cephalohematoma were performed puncture at 10-11 days of life; broken collarbone – immobilization by bandage for 7 days; in fractures of the femur and humerus – plaster traction for 3 and 4 weeks. With burns of I degree was carried out the toilet of the wound, then applied wet-drying bandage with an antiseptic dressings. When II degree burns – primary surgical treatment of burn wounds under general anesthesia, then wet-drying dressings with antiseptics. Burns III degree – tangential necrectomy with subsequent autodermoplastic.

All newborns were diagnosed with hemodynamic disorders and pain syndrome, performed intravenous anesthesia (25% solution of metamizol natrii 0.1 ml. twice a day), infusion therapy (5% glucose, given the daily volume of fluid based on the patients' age in days) [3,15]. At small cephalohematoma, mild pain syndrome, the proposed treatment was up to 2 days. When cephalohematoma more than 40 ml, and, when long bone fractures, duration of intravenous analgesia and fluid therapy up to 5

days. At the burn injury, the volume of infusion therapy is determined by the formula of Evans. Composition: predominantly crystalloids (10% glucose, ringer solution, 0.9% NaCl solution); colloids (10% solution aminoven) was administered in children with II degree with an area of more than 10% and III degree. Intravenous analgesia: a 50% solution of metamizol natrii 0.1 ml. x 2 p/ day, for 2-3 days with burns of I degree, up to 5 days with burns II and III degree. Due to birth trauma normalization of heart rate, blood pressure and relief of pain was noted by the beginning of the second day of hospitalization; when a burn injury to the beginning of the third day with burns of I degree, the beginning of 5 days with burns II and III degrees.

CONCLUSIONS

1. In children the first year of life with traumatic injuries, there is the changes in special status, hemodynamic (decrease in blood pressure, tachycardia or bradycardia), pain, changes of ECG (shortening of RR intervals, QT, the increase in SP), ultrasound of the brain and internal organs due to birth injury (periventricular edema and hypoxia; diffuse changes of kidneys, hemorrhage in the adrenal glands) and laboratory data (anemia, leukocytosis, compensated metabolic acidosis).

2. The algorithm of examination of

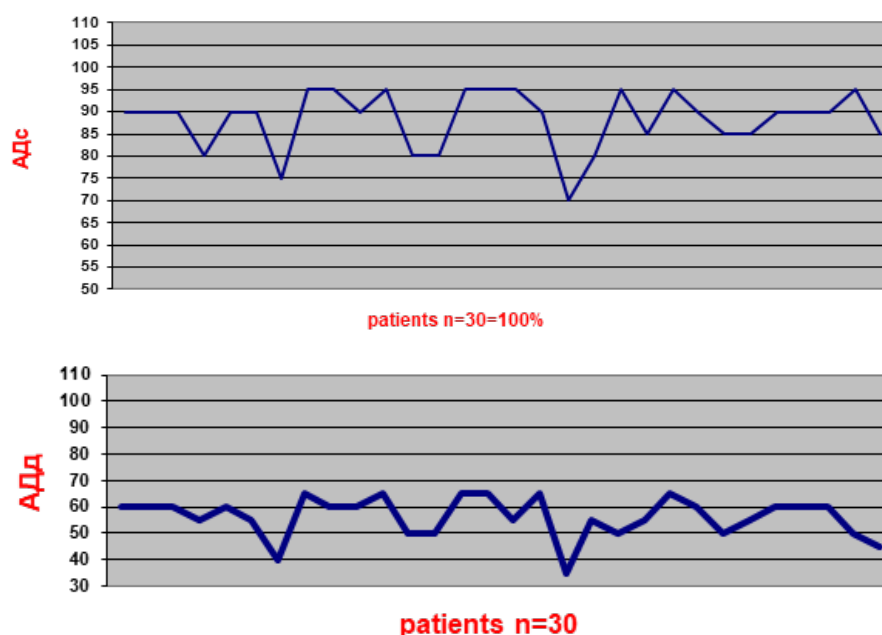


Fig. 2. The distribution of values of AD among children with burn injury

Table 2

The change in the ECG among children with the burn injury, %

Number of patients n=30	ECG indicator							Increase of systolic index
	Deviation of EOS sharply to the right	↓ QRS	↑ QRS	↓ RR	↑ RR	↓ QT	↑ QT	
	10	10	-	83	-	70	13	62

children first year of life trauma needs to be added: assessment of pain scale, determine clinical parameters of central hemodynamic, ECG, ultrasound of internal organs.

3. The results of a comprehensive survey to objectively justify the appropriateness of the appointment of analgesia, intravenous infusion in the treatment of injuries in children of first year of life.

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EARLY DYAGNOSIS OF NECROTIZING ENTEROCOLITIS IN THE NEWBORNS

ABSTRACT

Necrotizing enterocolitis (NEC) today hasn't objective reliable laboratory markers for early diagnosis. The article presents the results of studying structural and functional properties of erythrocyte membranes (structural-functional state - SFS) using original method for automatic registration of acidic and osmotic erythrogram (ARAOE) in 50 healthy newborns and 90 suffering from NEC. The study highlighted two laboratory markers, significantly changing their values depending on the stage of the disease.

Keywords: necrotizing enterocolitis, NEC, newborns, hemolysis, erythrocytes.

Objective: to identify the dependence of erythrocyte membranes structural-functional properties from clinical stages of NEC in newborns and to assess their diagnostic value.

Tasks

1. To evaluate structural-functional state of erythrocyte membranes in healthy newborns and NEC newborns with the help of automatic registration of acidic and osmotic erythrogram method.

2. To identify significantly changing of SFS in neonates with NEC depending on the stages of the disease.

MATERIAL AND METHODS

The study included 140 infants. The control group consisted of 50 healthy children (group A) and a group of 90

infants with NEC at different stages (group B).

Group A included 50 healthy newborns with a gestational age of 38-40 weeks, weighing 3500-3850g.

In group B 70% of the newborns were premature. Among concomitant pathology dominated brain ischemia of different severity (100% of cases). Intrauterine infection and septic state was accompanied by the incidence in

93.3% of cases. 74.4% of infants in group B had a weight less 2500 g., including at least 1000g. – 10%.

The study of the SFS method (ARAOE) was carried out according to the method developed at the Department of biophysics and biology faculty FGBOU VPO «Voronezh state University». Equipment: 56M FEK with integrated differential amplifier, two-coordinate recorder 4 LKD – 003, digital voltmeter

Table 1

Distribution on disease stages in the group "B" (n 90)

NEC stages (Walsh & Kliegman)	Стадии НЭК, по Walsh и Kliegman					
	IA	IB	IIA	IIB	IIIA	IIIB
Total (n 90)	22	20	18	10	12	8

Table 2

Distribution on gestational age in the group "B" (n=90)

Gestational age, (weeks)	Value, %
26-30	24
31-36	46
37-42	30

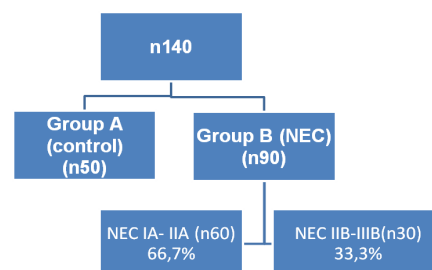


Fig.1 The structure of research.

Table 3

Distribution of newborns on weight in the group "B"

Weight	Value, %
< 1 кг (n9)	10,0
1-2,4 кг (n58)	64,40
2,5-3,2 кг (n23)	25,60

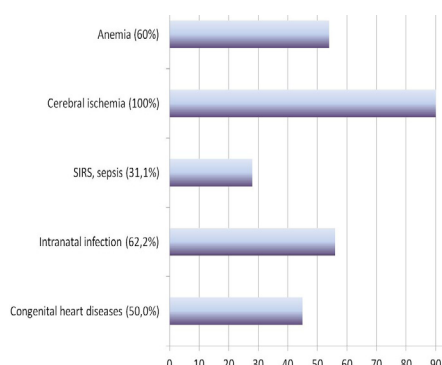


Fig. 2 Complementary pathology in the B gr. (n=90)

type B7-20, thermostat UTU-6 and personal computer.

The principle of the method ARAOE is a photometric check of the process of erythrocytes hemolysis. Kinetic curves (erythrogram) are graphic display of the sequential joining of red blood cells of various degrees of resistance to the stage of hemolysis.

The phases of research execution:

1. Blood sampling and preparation of erythrocyte suspension.

2. The study of hemolysis of red blood cells.

3. Check results.

Statistical data processing was carried

Table 4
Results of the surgical treatment in the group "B"

Results of the surgical treatment	Ab-solute quantity	Relative value, %
Surgery	30	100
Survived	26	86,6
Lethality	4	13,4

out on a personal computer using the statistical software package STATISTICA of StatSoft company, Inc., (USA) BIOSTAT version of 3.03 of the company Mc Graw-Hill, Inc. (USA).

THE RESULTS OF RESEARCH AND DISCUSSION

The obtained data demonstrates the growth of the constant maximum speed of hemolysis (Cmax) and the decrease in the acid resistance of the membranes (tlat) in the cases of clinical deterioration.

CONCLUSIONS

1. All investigated parameters of SFS method (ARAOE) is statistically significantly associated with the stages of NEC in newborns.

Table 6

The comparative characteristic of the average values of the measured indicators in researching groups

Researching group	G120, %	G30, %	Gmax, %	Kmax, o.e.	t лат, сек
Control gr. (n=50)	0,76±0,04	36,54±0,57	46±0,71	0,27±0,01	155,1±5,05
NEC IA-IIA	1,45±0,16	52,12±1,27	65,3±1,38	0,5±0	84,9±2,91
NEC IIB-IIIB	-2,25±0,32	45,0±0,45	65,57±1,3	0,97±0,27	66,67±1,52
Coefficients of reliability of differences between groups with the Student's criterion					
Control gr. - NEC IA-IIA	0,000011	0,000002	0,000001	0,000011	0,000001
Control gr. - NEC IIB-IIIB	0,000001	0,000001	0,000004	0,000001	0,000001
NEC IA-IIA - NEC IIB-IIIB	0,000000	0,000001	0,938322	0,000001	0,000001

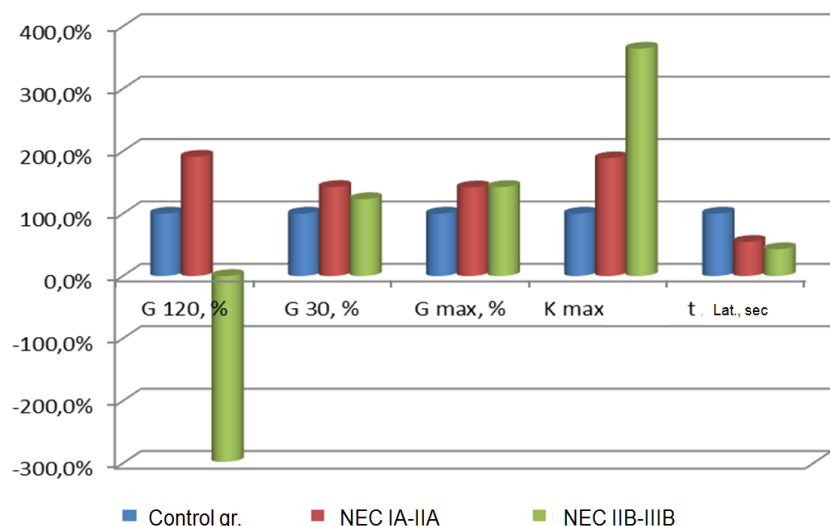


Fig. 3 The units values of the APKO3- method

Table 5

The studied indicators with APKO3 method

Unit	Value
G 120, %	Hypoosmotic hemolysis (the largest part of destroyed erythrocytes, placed in S.NaCl 0,55% during 2 min.).
G 30, %	Hypoosmotic hemolysis (the largest part of destroyed erythrocytes, placed in S.NaCl 0,55% during 30 min.).
G max, %	The largest part of the destroyed erythrocytes with hemolysis.
K max	Constant of the maximum speed of hemolysis.
t lat, sec.	The acid resistance of the erythrocytes.

2. The highest correlation coefficients are characteristic of the constant maximum speed of hemolysis (Cmax) (direct) and acid resistance (tlat) (reverse).

3. Newborns with the most severe NEC have the highest value of the indicator Cmax the smallest tlat.

4. There is a high statistically significant correlation between Cmax and tlat with the stages of NEC in newborns, that in combination with the low cost and ease of process definition allows to consider them as a promising additional markers for early diagnosis of this disease.

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Table 7

The correlation coefficients (NEC clinical gravity vs structural properties of the erythrocytes)

Unit	The correlation coefficient value	p
G 120, %	-0,60141	0,005
G 30, %	0,441241	0,032
G max, %	0,723849	0,001
Kmax, o.e.	0,840725	0,001
tлат, c.	-0,81557	0,001

Table 8

The regression model of influence of the NEC clinical gravity on erythrocytes properties

Unit	Coefficient	Standard error	T-statistics	Significance value
Constant	0,574221	0,237469	2,41809	0,0172
G120	0,00514457	0,0189083	0,27208	0,7860
G30	0,0137278	0,00273114	5,02642	0,0000
Gmax	0,0133121	0,00274893	4,84263	0,0000
Kmax	0,123543	0,0093605	13,1983	0,0000
T lat	-0,00407331	0,000768043	-5,30349	0,0000

Note. Determination coefficient $R^2=92,69\%$. Standard error = 0,216124. Average absolute percentage error of forecasting = 0,165798.

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PURULENT APPENDICULAR PSEUDOMONAS PERITONITIS IN CHILDREN AND OPTIMIZATION OF ITS TREATMENT

ABSTRACT

Over the past decade (2007-2016), *Pseudomonas* etiology of acute purulent destructive appendicitis in children of the Central Chernozem region has been detected clinically, intraoperatively and bacteriologically in 4-5 patients per year. Totally, over this decade, *Pseudomonas* etiology of the disease was found in 44 children of age from 2 years 3 months to 14 years old suffering from purulent perforated peritonitis of appendicular origin. The clinical course of diffuse purulent appendicular *Pseudomonas* peritonitis turned out to be more severe and dangerous than in similar patients with peritonitis caused by enterobacteria: *Escherichiosis*, *Enterococcal*, *Enterobacter*, etc. Traditional combined treatment of such pediatric patients proved to be inefficient due to the resistance of *pseudomonas* flora to traditional antibacterial drugs. Combined treatment of studied patients with perforation *Pseudomonas* peritonitis is successfully supplemented by the newly developed differential anti-*pseudomonas* therapy. It has been successfully used in such patients to prevent the development of abdominal *pseudomonas* sepsis and to provide patients with full clinical recovery.

Keywords: children, acute gangrenous perforated appendicitis, purulent perforation peritonitis, *pseudomonas aeruginosa*, antibiotics, differentiated combined treatment of patients with peritonitis.

URGENCY

Improvement of the quality of diagnostics and the efficiency of combined treatment of children with gangrenous perforated appendicitis and purulent *Pseudomonas* peritonitis accompanied by the reduction in the incidence of sepsis and the threat to the child's life is an urgent issue of current pediatric surgery and pediatrics in general. According to the results of previous (1,2) bacteriological studies of biomaterials of the abdominal cavity with the intestinal perforation, among the causes of acute appendicitis a decrease in the frequency of *Escherichia coli* growth was observed, with the absolute dominance of another enterobacterial autoenterogenic flora. Among the children's population of the Central Chernozem region, intestinal dysbiosis with predominance of the *Pseudomonas* flora was definitely identified (3.4). According to a number of other well-known publications (1.2.3.5), intestinal contamination with *Pseudomonas aeruginosa* has become more frequent in children of Russia and abroad. Late diagnosis of acute gangrenous perforated appendicitis caused by *Pseudomonas aeruginosa* in different age groups provides frequent development of *Pseudomonas* peritonitis for which traditional combined treatment turned out to be low efficient.

MATERIAL AND METHODS

Over the past decade (2007-2016), *Pseudomonas* etiology of acute purulent

destructive appendicitis in children of the Central Chernozem region has been detected clinically, intraoperatively and bacteriologically in 4-5 patients per year. Totally, over this decade, *Pseudomonas* etiology of the disease was identified and investigated in 44 children of age from 2 years 3 months to 14 years old suffering from gangrenous perforation peritonitis, diffuse purulent appendicular peritonitis. Among other causative agents classified as conditionally pathogenic enterobacteria there were the following. *Escherichia coli* was identified as 68.5% enterococcus, 11.8% enterobacter, and 15.2% anaerobes. *Klebsiellae oxytoca* in 7 (5.9%) patients and *Staphylococcus* in 2 children were much less frequently identified. According to the age of patients with appendicular purulent *Pseudomonas* peritonitis, children were ranged as follows: 1 to 4 years old - 3 children, 4 to 7 years old - 11 patients, 7 to 10 years old - 12 children, 10 to 14 years old - 18 patients; as for sex groups, treatment was given to 25 boys and 19 girls. Distribution of patients by sex, age, prevalence of purulent-destructive process in the abdominal cavity in *Pseudomonas* appendicular peritonitis is presented in Table 1.

Biomaterial cultures for all 44 pediatric patients giving evidence of *Pseudomonas* origin of appendicular peritonitis, initially included: intraoperative abdominal effusion, repeated bacteriological examination of

the contents of septic wounds, purulent cavities, blood, urine for microflora, and antibiotic susceptibility. Microbiological identification of microorganisms was carried out with the help of a plate reader Labsystems iEMS Reader MF using commercial microtest systems and the computer program «Microbe-automat» and «Microbe-2». The method for serum procalcitonin (PCT) determination was performed using an express-test by Brahms A.G. company as a biochemical method for diagnosing *Pseudomonas* sepsis in peritonitis with the assessment of its severity. For statistical processing of the results obtained, the distribution law of multidimensional quantities was used (according to A.I. Rog and V.S. Malaychuk, 1978). Antimicrobial susceptibility of microorganisms was determined by the serial dilution method and the diffusion method, which included 2 modifications - disc-diffusion test and E-test. Modern approaches to determining the antimicrobial susceptibility of bacterial pathogens are based on EUCAST (European Committee on Antimicrobial Susceptibility Testing) guidelines, as well as the «Recommendations of the NCCLS (National Committee for Clinical Laboratory Standards, USA) guidelines».

STUDY RESULTS

Over the past decade (2007-2016), acute purulent appendicular *Pseudomonas* peritonitis was diagnosed in 44 children of preschool and school age. This amounted to 4-5 children with

Pseudomonas peritonitis of appendicular origin annually. When revising the abdominal cavity intraoperatively appendicular *Pseudomonas* peritonitis was diagnosed by the characteristic infiltrative inflammation of the parietal and visceral peritoneum and fetid purulent effusion. The diagnosis in all 44 patients was reliably confirmed by the active pathogen (*Pseudomonas aeruginosa*) growth. The incidence of acute *Pseudomonas* appendicitis varied in different age groups of patients: the lowest rate was in the age of 4 years (3 children) and the highest one was observed in patients above 7 years old (30 cases). Characterizing the dynamics development of purulent *Pseudomonas* process in the abdominal cavity in children, it should be recognized that this process spreads more actively over the area of inflammation in perforation of the gangrenously changed vermiform appendix, which is confirmed by the data of Table 1.

Only in 8 (18.2%) patients of different ages the inflammation was local, *Pseudomonas* peritonitis in other 33 (75%) children was diffuse and 3 patients (6.8%) demonstrated total peritonitis. The rapid development of clinical symptoms in purulent inflammation of the abdominal cavity indicates expressed aggressiveness of the *Pseudomonas aeruginosa* pathogen. In all 3 patients of the age group 1-4 years old perforation of the appendix with the development of peritonitis occurred within the first 24 hours, which was confirmed by intraoperative and histopathological examination. Speedy course of the disease is typical for patients with *Pseudomonas* peritonitis in other age groups, too. Thus, the perforation of the gangrenous-modified vermiform appendix during the first day of the disease was confirmed intraoperatively in 13 patients, including 5 (of 11) patients aged 4-7 years, in 6 (of 12) children of the age group 7-10 years old and only in 2 girls (of 18 patients) of the age group of 10-14 years old.

The remaining patients (31 children) showed the developed purulent peritonitis with perforation of the appendix by the end of the second day. By this period of the disease in 27 children purulent appendicular peritonitis had already had a diffuse character. Among them: in 6 children with atypical location of the appendix and late diagnosis of the disease, purulent peritonitis was diffuse in 4 patients and total in 2 children. The local

form of *pseudomonas* inflammation of the abdominal cavity in these patients in the postoperative period was complicated by an abscess of the anterior abdominal wall in the area of the operating wound (in 4 children), an abscess of the omentum (in 2 cases).

Intraoperatively, fetid pus in the abdominal cavity was evacuated by an electric pump in the amount of 100-200 to 250 ml. In 16 (36.4%) of the patients studied, the appendix was located in the small pelvis, in the other 17 (38.6%) patients it was located retrocectically. Involvement of the cecum and omentum into inflammation was taken into account during the sanation and the need for drainage of the abdominal cavity. Removal of the appendix in all 44 children was carried out with a purse-string technique, without any technical difficulties. Sanitation and drainage of the abdominal cavity were performed in pediatric patients taking into account the severity of the purulent-destructive process. Resection of omentum sections was carried out within healthy tissues with the severity of inflammation in 20 patients. In 3 children, when performing the abdomen revision, abscesses in the infiltrated omentum were tapped. In 4 cases of appendicular *Pseudomonas* peritonitis, the disease was complicated by the formation of abdominal infiltrates, which were successfully sanitized with conservative methods. For all 44 patients, the prevalence and severity of the purulent process were taken into account in surgical technique and intensive care. In all cases, the operation was completed with draining the abdominal cavity. Drainages were installed in the abdominal cavity in the flanks and to the bed of the appendix. They functioned and remained in the abdominal cavity of the operated child for 3-4 postoperative days.

Results of the histopathological study of the drug: «destructive gangrenous-perforated appendicitis, massive fibrinous-purulent periappendicitis, mesenteriolitis, purulent omentitis.»

Intraoperatively, all 44 children underwent bacteriological swab test of the abdominal effusion for the flora and antimicrobial susceptibility. In 35 (79.5%) of 44 patients, abundant growth of *Pseudomonas aeruginosa* monoculture, sensitive to amikacin, ciprofloxacin, cefepime, ceftazidime, carbenicillin, and tazobactam, was found. In other 9 patients with *Pseudomonas* peritonitis the causative agent of the disease helped to reveal a *Pseudomonas* mix-infection, including its combinations with other enterobacteria (with *Enterobacter cloacae* in 1 patient and *Escherichia coli* in 3 children) after 2-3 days of the disease (repeated sampling of the abdominal effusion). In 3 other cases, a combination of *Pseudomonas aeruginosa* with epidermal staphylococcus - *Staph. Epidermalis* was detected. Among the detected pathogens of *Pseudomonas* peritonitis of appendicular etiology, except for *Pseudomonas aeruginosa*, other *Pseudomonas* strains (*Pseudomonas fluorescens* in one patient and *Pseudomonas putida* in another patient) demonstrated an active growth of the culture. But these strains of *Pseudomonas* infection were no less aggressive than *Pseudomonas aeruginosa*, causing a very severe course of perforation peritonitis. *Pseudomonas fluorescens* and *Pseudomonas putida*, were also sensitive, like *Pseudomonas aeruginosa*, to amikacin, cefotaxime, ceftazidime, cefepime, meropenem, ticarcillin.

Discussion of the results: Acute appendicitis in children of different ages is still among the difficultly diagnosed childhood diseases in public health. In the conducted studies, *pseudomonas* inflammation and destruction of the appendix with the development of peritonitis proceeded classically and was diagnosed in the preoperative period at the end of the first day of the disease in 13 (29.5%) children. The disease developed acutely, beginning with abdominal pain, nausea, vomiting, general weakness,

Table 1

Distribution of pediatric patients by sex, age, prevalence of purulent-destructive process in the abdominal cavity in *Pseudomonas* appendicular peritonitis (n=44)

Age	Boys	Girls	Local	Diffuse	Total
1-4 years old (n= 3)	2	1	-	1	2
4-7 years old (n= 11)	6	5	2	8	1
7-10 years old (n=12)	6	6	2	10	-
10-14 years old (n= 18)	10	8	4	14	-
Total = 44	25	19	8	33	3

subfebrile condition (up to 37.5C). Abdominal pain was pronounced and permanent. The diagnosis of acute appendicitis in this group of patients, including children aged 1 to 4 years old, was made in the first day of the disease without difficulties and doubts, by means of objective examination by a first contact physician. In pre-school and school-age patients, *Pseudomonas* peritonitis was diagnosed by an objective examination of the doctor after 24 hours from the onset of the disease. These children, within 2-3 days after the onset of the disease, have demonstrated total purulent fecal peritonitis, purulent omentitis, mesadenitis. Studies of the susceptibility for cultures of *Pseudomonas* strains in 44 children with perforated peritonitis have shown that in recent years the microbe still remains sensitive to a large number of antibacterial drugs, as indicated in Table 2.

According to Table 2, the susceptibility of *Pseudomonas* cultures to different antibiotics in patients with acute purulent perforated peritonitis is different: it is the highest in imipenem - 93%, ceftazidime - 90.3%, amikacin - 87%, meropenem - 83.3%, ticarcillin - 83.3%. Significantly less sensitive are cefepime - 71% and ciprofloxacin - 55%. The lowest sensibility was demonstrated by *Pseudomonas* to carbenicillin, amoxiclav and other antibiotics. The most highly effective anti-*Pseudomonas* drugs in our studies were antiseptics, which showed a high level of antimicrobial effect: chlorhexidine 71%, bacoderm -71%.

Empirical antimicrobial therapy of patients with purulent appendicular *Pseudomonas* peritonitis was started in the perioperative period in the intensive care unit environment. Its efficiency was significant in the combined treatment of a pediatric patient who was in critical condition. Patient's condition was evaluated by the degree of subsidence of clinical signs of peritonitis in the early postoperative period. In a modern pediatric surgical hospital, it is reliably confirmed clinically and in laboratory, even before obtaining the result of identification of the microorganism – the causative agent of peritonitis. Persistent fever, oliguria, intoxication, toxic intestinal paresis, which persisted in a patient in the first days after the operation, required a search for the cause of the pronounced activity of the infection of the abdominal cavity after its intraoperative sanitation. It was established through the joint efforts of pharmacologist, a pediatric

surgeon and an emergency physician on the basis of available objective clinical and biochemical tests of the patient's condition as a reason for the low effectiveness of starting postoperative intensive care. Traditionally, it is known that the expected results of the bacterial test of the effusion are received by the attending physician from the laboratory only by the end of the 3rd day of bacteriological diagnostics, while the data on the antibiotic susceptibility of the microbial culture - only on the 5th day of the bacterial swab test. Therefore, all doubts about the inefficiency of starting antibiotic therapy were resolved in favor of the patient. The substitution of the antibiotic with a drug more significant in the treatment of pediatric patients with peritonitis has now become a rational kernel of getting a therapeutic effect in patients with a complicated course of autoenterogenous disease - acute appendicitis in the environment of a modern surgical clinic.

Evaluating in this study the efficiency of a traditional starting antibiotic therapy in patients with appendicular *Pseudomonas* peritonitis, it was established that it was not always effective enough against *Pseudomonas* infection. Traditionally, starting empirical antibacterial therapy for such patients included antibacterial drugs, which, according to the results of their use, always proved to be highly effective, as indicated in Table 3.

According to Table 3, the absence of the expected clinical effect of the use of cefazolin, ceftriaxone, amoxiclave, ampicillin in 26 patients with perforation *Pseudomonas* peritonitis make the doctor substitute these drugs taking into account the data of bacterial swab tests. The antibiotic was changed for drugs with a high rating of therapeutic effect in pediatric patients with suspected or identified *Pseudomonas* infection (ceftazidime, amikacin, meropenem, imipenem). The

revealed tendency to the formation of abdominal wall infiltrates (3 patients) and abdominal infiltrates in the other two patients with *Pseudomonas* peritonitis is explained by the administration (together with a pharmacologist) of more effective drugs (vicef, imipenem, meropenem) to these patients. Such decisions to replace the antibiotic with a more effective, considering the data of bacterial swab tests for a certain patient, were taken collectively during the treatment of the child in the intensive care unit and reanimation in accordance with the established standard. If against intensive therapy after 4 - 5 days of the postoperative period the patient with appendicular peritonitis of any etiology continued to fever and the hyperleukocytosis in the peripheral blood persisted, it is carried out in-depth analysis of the course of the surgical pathology, the patient was evaluated with the effectiveness of antibiotic therapy and infusion therapy, also the patient was screened for sepsis, postoperative infiltration, an abscess, an abdominal pyogenic abscess which was formed but not diagnosed in the abdominal cavity or beyond it. Replacement antibiotic with reserve preparations (thienam, meronem, imipenem), detoxification treatment expansion, transfer to complete parenteral nutrition (aminoplasmal, lipofundin) eliminated the risk of sepsis and other complications of the purulent process in the abdominal cavity. This was particularly true for children who were operated in the later stages of the disease. Among these patients, there were 2 children with total *Pseudomonas* appendicular peritonitis who had already been operated in the stage of developed abdominal sepsis and septic pneumonia, but with favorable results of combined treatment - recovery.

Today it is necessary to recognize the particularly important diagnostic role of

Table 2

Results of studies on antimicrobial susceptibility of *Pseudomonas* cultures in children with perforation peritonitis (n=44), in bacteriological swab tests of abdominal effusion

Drug	Number of patients with peritonitis	Number of studied bacteriological swabs of <i>Ps. aeruginosa</i>	Antibiotic susceptibility, %
ceftazidime	44	28	90,3
amikacin	44	27	87
cefepime	44	22	71
ciprofloxacin	44	17	55
cefotaxime	44	9	29
imipenem	14	13	93
meropenem	12	10	83,3
ticarcillin	12	10	83,3

Table 3

Drugs of empiric antimicrobial therapy used (%) for treating pediatric patients with perforation *Pseudomonas* peritonitis of appendicular origin (n=31)

Drug	Susceptibility of a <i>Pseudomonas</i> microbe	Number of treated patients (n=)	Percentage	Drug substitution
Amikacin	++++	13	42	no
Ceftazidime	++++	10	32,2	no
Ciprofloxacin	++++	3	9,7	no
Cefotaxime	+++	16	51,6	no
Cefazoline	+	7	22,6	yes
Ceftriaxone	+	8	25,8	yes
Amoxiclav	+	9	29	yes
Amoxicillin	+	2	6,5	yes

modern high-tech devices (ultrasound and X-ray CT of the abdomen) to identify the unclear causes of fever and other manifestations of purulent complications in patients with peritonitis. Among 6 (13.6%) severe patients, radiation diagnostic methods (ultrasound, X-ray CT) revealed intraperitoneal infiltrates in 2 patients (4.5%), purulent infiltrates in the area of the postoperative wound in 3 other patients (6.8%), and an intra-abdominal abscess was diagnosed in 1 child. To treat these patients, different methods of treatment have been successfully used: both traditional treatment such as tapping and emptying the omentum abscess (in 1 patient), and conservative treatment of intra-abdominal infiltrates (in 2 pediatric patients) and infiltrates of the anterior abdominal wall. Conservative treatment of infiltrates occurring on the 8th-19th day of the disease, along with antibiotic therapy, included modern physiotherapy: magnetotherapy No. 5-7, iruksol phonophoresis, and laser therapy. Anti-adhesion therapy included administration of electrophoresis with KJ, lidase No. 10 on the right iliac region, laser therapy No. 8-10. There were no cases of early adhesion in the studied 44 children with appendicitic *Pseudomonas* peritonitis. In this group of patients, disability was not recorded either, while the outcome in abdominal sepsis was diagnosed only in 2 patients (4.5%) admitted to the hospital at the stage of generalization of the purulent infection. There were no cases of lethality among 44 children of different ages.

CONCLUSION

Pseudomonas etiology of acute appendicitis in children, established by clinical, intraoperative and bacteriological study in appendicular peritonitis, which has become more frequent in recent years, turned out to be the result of intestinal dysbiosis. Among the identified opportunistic pathogens of

appendicular *Pseudomonas* peritonitis, an active growth of the culture was observed predominantly for the *Pseudomonas aeruginosa* strains (in 42 pediatric patients) and rarely for *Pseudomonas fluorescens* in 1 patient and *Pseudomonas putida* in another patient. These strains of *Pseudomonas* infection were no less aggressive than *Pseudomonas aeruginosa*, and caused a very severe course of perforation peritonitis. The obvious reason for the insufficient effectiveness of combined treatment of patients was considered to be the resistance of the *Pseudomonas* flora to the majority of traditional starting antibacterial drugs, especially in patients with the threat of development of abdominal sepsis. Due to the successful application of modern high medical technologies (ultrasound, laparoscopy, bacteriological, biochemical and X-ray computer studies) in the studies undertaken, it has now become possible to provide patients with early diagnosis of the etiology of appendicular peritonitis and early effective treatment, to prevent the development of abdominal sepsis and multiple organ failure. In patients with appendicular peritonitis and the suspicion or identification of *Pseudomonas* flora, the need for correction of starting antibiotic therapy is reliably confirmed, with the administration of carbapenems or cephalosporins of III-IV generation in combination with aminoglycosides (amikacin, selmemylin). *Pseudomonas fluorescens* and *Pseudomonas putida* are particularly sensitive to amikacin, cefotaxime, ceftazidime, cefepime, meropenem, ticarcillin, chlorhexidine. These drugs in modern conditions largely provide the clinical efficiency of starting antibiotic therapy, until the results of bacterial swab tests for abdominal effusion are obtained. Today, for children with purulent appendicular *Pseudomonas* peritonitis, early targeted

anti- *Pseudomonas* antibacterial therapy is the basis of the therapeutic effect of postoperative intensive therapy and the prevention of *Pseudomonas* abdominal sepsis and multiple organ failure.

Conflict of interest: The authors declare no conflict of interest.

Funding: The study was not supported by sponsors.

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Conflict of interest: The authors declare no conflict of interest.

Funding: The study was not supported by sponsors.

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RESULTS OF TREATMENT OF CHRONIC COLOSTASIS AND HIRSCHSPRUNG'S DISEASE

Chronic colostasis (CCS) is an actual and not fully resolved problem in pediatrics in general, and in pediatric surgery [4,5]. Despite the modern development of coloproctology, many aspects of diagnostic and treatment algorithm, as well as questions of rehabilitation after conservative and surgical treatment are still unresolved, controversial and are in need of further verification and clarification [4, 7, 8].

During the literature review of surgical treatment of children with CCS and Hirschprung's disease (HD), in a sufficient percentage (up to 30-40%), in a further period a large number of complications such as, gas and stool incontinence, relapses on constipation, stenosis of anastomoses [1, 4, 5, 6,]. A significant number of patients after multiple surgical interventions, have expressed adhesion processes in abdominal cavity, what is directly related to the traumatic nature of reconstructive operations, and lengthens the terms for rehabilitation [3]. These groups of children are placed on a list and treated in specialized departments,

more often in Republican and Federal centers, as they require adequate rehabilitation therapy, which are unable to carry out in clinic services in central cities of Russia, not talking of remote areas. The reasons for such appeals, for a purpose to provide medical assistance, are persistent functional disorders, due to which child becomes disabled.

The aim of the study was to evaluate the immediate and long-term results of conservative and surgical treatment of CCS and HD.

To achieve the goal, we examined and treated 108 children with various forms of chronic colostasis. Patients were divided in to 3 groups according to a clinical classification of CCS by A.I. Lyonyushkin. In group with compensated form of chronic colostasis, were included children with episodic disorders in functioning of colon. Constipations with a presence of an independent defecation lasted for 2-3 days. In subcompensated form of disease children complained about periodic constipations with a followed independent defecation, that did

not bring relief. Children were ill during several years and the: abdominal pain, flatulence, and accumulation of fecal matter in the colon appeared. In children with decompensated form of CCS clinical picture was characterized by a more noticeable disorders in functioning of colon. The delay of stool was persistent and lasted up to 7 days and more, independent defecation did not bring relief. The abdomen was enlarged, paradoxical encopresis was observed.

Compensated form of chronic colostasis was diagnosed in 37 (34,26%) children, subcompensated in 48 (44,44%) and decompensated in 23 (21,29%) (Diagram 1)

Study included children aged from 1 to 17 years. The detailed distribution of children by age and form of CCS is illustrated in Table 1.

In 37 patients with compensated form, the treatment began of following conservative measures: diet, laxatives, physiotherapy, exercise therapy and massage of anterior abdominal wall. The diet included vegetables, salads on

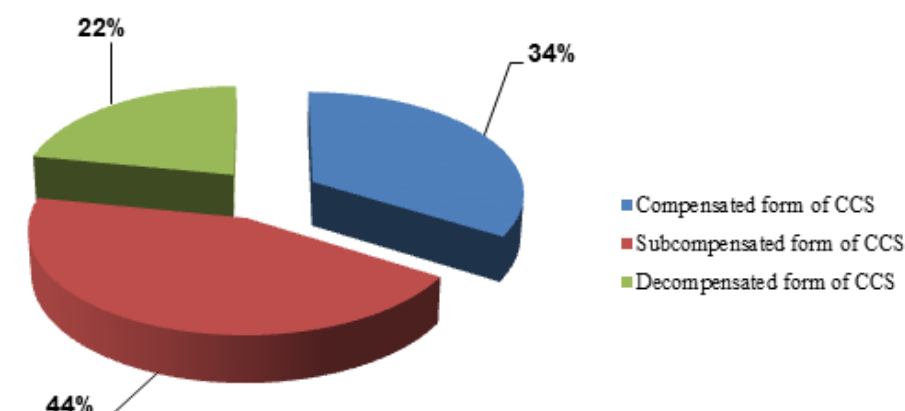


Diagram 1. Distributions of various forms of chronic colostasis.

Table 1

Distribution of patients by age and form of disease

Age periods, years	Form of chronic colostasis		
	Decompensated	субкомпенсированная	декомпенсированная
Early childhood (1-3)	7	18	10
Preschool (4-7)	10	12	3
School (8-11)	12	9	3
School (12-17)	8	9	7
Total	37	48	23

vegetable unrefined oil, as well as fresh fruits and dried fruits with a predominant content of plum, dried apricots and raisins, bread of coarse black grinding in a constant ration, with adding a bran in it. Drug treatment was carried out comprehensively, taking into account all disorders that were revealed during the examination, and the dynamics of changes in blood tests (detailed general and biochemical).

After the first course of conservative treatment in patients with compensated form of CCS, after the discharge, a persistent improvement was noted in 85,4% of patients (n=41). At a repeated hospitalization (3 months after diagnosis), only in 7 (25,9%) of patients have remained complaints of stool retention. That required additional comprehensive courses of therapy, with achieving of satisfactory results of treatment.

Complex of conservative therapy in group of patients with compensated form of CCS (n=48) fundamentally did not differ from that in patients with compensated form of disease. It included the following main components: correction of diet, that included foods that are high in fiber, and an increase in the amount of fluid in patients ration. As in previous group, physiotherapy was performed (electrophoresis with KI, electrostimulation of colon, paraffin-ozokerite, etc.), exercise therapy and abdominal massage.

When the constipation is combined

with encopresis, an electrostimulation of neuro-muscular apparatus of rectum with diadynamic currents was performed.

The vitamins of "B" group (B1, B6, B12), proserine in age-related dosage were prescribed. For all patients with subcompensated form of CCS, additionally was held an compulsory antioxidant therapy, that included multivitamins and vitamin "C", as well as vitamins PP, E, K, A.

To correct the revealed disorders at hemostasis system, disaggregants were prescribed. For restoration of microbiota of the colon pre and probiotics were used, in harsh dysbiosis, bacterostatics were used at age-related dosage. Treatment with bacilli continued for at least 2 months after diagnosis with subsequent control at repeated hospitalization.

In patients with subcompensated form of CCS (n=23), in 3 kids from this group, after first course of conservative therapy, a "persistent positive effect" was noted. The periodicity of defecation increased to 1 time in 2 days after first course of conservative therapy.

In 7 children idiopathic megarectum

was detected, with no positive effect from the held therapy, it is worth noting that of this children was from 14 to 17 years, and these are the children who are from early age suffered from constipation and did not receive appropriate therapy before contacting our clinic. For them was performed the laparoscopically assisted low anterior resection on left parts of colon, with formation of above-anal colorectal hardware anastomosis. In 10 children the Hirschprung's disease diagnosis was verified, of which in 2 cases the subtotal form of disease was detected, all children were aged from 1 to 2 years, in all cases there was no independent defecation. In 6 cases in children recto-sigmoid form of HD, laparoscopically assisted resection of left parts of colon, with formation of above-anal colorectal anastomosis by Soave-Georgeson, was performed. In 2 cases laparoscopically assisted subtotal colectomy with a turn of colon by 180°, with formation of above-anal colorectal anastomosis was performed.

Properly 3 children have diagnosis of subcompensated form of CCS, not amenable for conservative therapy. These patients underwent laparoscopically assisted intraperitoneal left-sided hemicolectomy with formation of above-anal colorectal anastomosis.

In most cases (78,3%), in postoperative period no complications was observed, children were discharged from hospital after 10-12 days. With a control examination after 1 month, 6 months and 1 year. At the stages of postoperative rehabilitation, children received corrective therapy in the form of pro and prebiotics, drugs from group of trimebutine maleate (Trimebat), complex physiotherapy.

For one child a sigmoidostoma was imposed in a newborn period due to low intestinal obstruction. At age of 4 months – elimination of stoma, resection of part of intestine, imposition of anastomosis. In early postoperative period – suppuration of the wound, preservation of manifestations of low intestinal obstruction, bloating. Cecostoma was imposed. In age of 1 year and 11 months laparotomy, separation of adhesions, Svenson's operation, closure of

Table 2

Distribution of patients by etiology and pathogenesis of functional disorders after surgery on cause of Hirschprung's disease

Pathogenetic causes of functional disorders	Number of patients	Conservative therapy	Surgical therapy
Cicatricial stenosis, deformation of anastomosis	2	2	-
Mental diseases	2	2	-
Multi-staged operations	2	-	2

Table 3

Evaluations of the results of questionnaire survey of children and parents

Evaluation criteria	Criteria characteristic	Score in points
Frequency of defecation	1-2 times a day	2
	3-5 times a day	1
	More than 5 times a day	0
Encopresis	Absence	2
	In stressful situations	1
	Always	0
Constipations	Everyday defecation	2
	Defecation 1 time per 2-3 days	1
	Defecation less often than 1 time per 3 days	0
Ability to delay defecation	For minutes	2
	For seconds	1
	Absence	0
The form of stool	Formalized	2
	Liquefied	1
	Liquid	0
The need for any therapy	No	2
	Sometimes	1
	Always	0

colostoma was performed.

Cecostoma was imposed to another child at age of 7 months, to discharge the colon. This patient entered children's surgery hospital in an emergency order, with a suspicion of intestinal obstruction. A laparotomy was performed, during which 2 zones of disangiosis in sigmoid were identified. Was operated again in age of 10 months – relaparotomy, resection of 20 cm of sigmoid, imposing anastomosis "end to end". After 13 days extraperitoneal closure of cecostoma was performed.

Analysis of long term results of surgical treatment of children with decompensated form of CCS and Hirschsprung's disease was performed in 20 patients (18,5% (n=108) in the study and 86,9% (n=23) in group with subcompensated form of CCS), in age from 1 to 17 years (two were operated in emergency order). By age, material was distributed as follows; 1 – early childhood (1-3 years); 2 – preschool age (4-7 years); 5 – adolescence (12-17 years).

In long-term postoperative period the following complications were occurred: relapse of constipations – in 2 patients, on the background of anastomosis, incontinence of feces – 2, incontinence of urine – in 1 case (Table 2).

Patients underwent irrigography, sigmoidoscopy, ultrasound examination of intestine, a questionnaire and clinical examination (Table 3).

According to the tables, 18-17 points corresponded to normal physiological

Table 4

Evaluation of results of clinical examination of children

Evaluation criteria	Criteria characteristic	Score in points
Appearance of the anus	Serried	2
	Partly serried	1
	Gaping	0
Ampulla of rectum	Not expanded	2
	Slightly expanded	1
	Extensively expanded	0
Stenosis of anastomosis	No	2
	Minor	1
	Expressed	0

intestinal functions, i.e., social adaptation; 16-14 points – satisfactory social adaptation, some limitations of social life; 13-10 points – significant limitations of social life (poor social adaptation); 9 and lower points – total incontinence of feces (complete social disadaptation).

According to the results of the treatment, based on sums of points (tables 3,4), all patients were divided into 4 groups: the 1st group (18-17 points according to the questionnaire survey) - 77 patients (71.3%), the result was regarded as «excellent»; The 2nd group (16-14 points) - 24 (22.2%), the result is regarded as «good»; The third (13-10 points) - 5 (4.6%), the result is regarded as «satisfactory» and the 4th (below 9 points) - 2 (1.9%), this result is regarded as «unsatisfactory», this children underwent further reconstructive-restorative operations, with a long rehabilitation course.

All patients operated for case of chronic colonic stasis and Hirschsprung's disease received a comprehensive rehabilitation program that included: mandatory supervision of a pediatric surgeon, a child psychologist, a neurologist and a rehabilitation specialist, what improved the quality of life of operated children and allowed to achieve good long-term results.

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CENTRAL HEMODYNAMICS IN CHILDREN OF DIFFERENT AGE WITH COMPLICATED FORMS

ABSTRACT

The difficulty in diagnosing and treating complicated forms of appendicitis in children is determined by the limited compensatory capabilities of the child's organism and by the rapid involvement of various organs and systems in the process. Already from the first hours of development of peritonitis, there are violations from the cardiovascular system and other organs and systems, which are then aggravated and can lead to multi-organ failure and an unfavorable outcome. The article presents the results of the study of the peculiarities of central hemodynamics in complicated destructive appendicitis by the method of Poedintsev-Voronova by the device «Cardiocode». As a result of the study, 3 hemodynamic parameters were detected, significantly changing their values depending on the stage of the inflammatory process in the appendix.

Keywords: appendicular peritonitis, central hemodynamics, «Cardiocode».

INTRODUCTION

Diagnosis and treatment of acute destructive appendicitis in children has always remained an urgent problem in emergency surgery. This circumstance is associated with a high incidence of acute appendicitis, a significant number of complications (up to 12.7%) and a frequency of diagnostic errors (up to 12) [1-3, 5].

Despite the vastness and variety of methods of diagnosis and treatment, mortality in acute appendicitis does not decrease, and remains stable - 0.1-0.2% [5]. Destructive forms of acute appendicitis are connected with the rapid development of the inflammatory process in the appendix, atypical clinical manifestations and the difficulty of diagnosis. The percentage of postoperative complications, especially severe ones, these are the development of sepsis (15%) and multiorgan insufficiency in children (21%) [1-6].

Because of the frequency of complicated forms of acute appendicitis, the absence of a tendency to reduce the frequency and severity of purulent-inflammatory complications, the issues of preventing the development of inflammatory complications acquire great medical and social significance.

The difficulty in diagnosing and treating complicated forms of appendicitis in children is determined by the limited compensatory capabilities of the child's organism and by the rapid involvement of various organs and systems in the process. Already from the first hours of development of peritonitis, there are disorders from the cardiovascular system and other organs and systems, which are then aggravated and can lead to multi-organ failure and an unfavorable outcome. These pathological changes are most pronounced in children of younger age group, in whom the

diagnosis of disorders by organs and systems is difficult. In this case, children are affected not only the organs of the abdominal cavity, but also due to endotoxemia, the cardiovascular system (pumping function of the heart) suffers significantly. Especially these disorders occur in children with complicated forms of destructive appendicitis [5, 7].

Many researchers consider peritonitis as peritoneal sepsis, in which the focus of infection is the abdominal cavity. Any septic state is also stressful, characterized by a typical violation of central hemodynamics (CH) and disorders of regional circulation in the form of centralization of blood flow and worsening of blood circulation at the periphery. First of all, at this mesenteric blood flow suffers. The main mechanism of disorders is spasm of the peripheral arterial bed, activation of arterio-venous shunting, venous plethora [3-7].

Objective of the research: to improve the results of treatment of children with complicated forms of destructive appendicitis by early detection of cardiovascular disorders and monitoring the efficiency of therapy.

Tasks:

1) to study the incidence of complicated forms of acute appendicitis in Voronezh region.

2) to study the characteristics of central hemodynamics by the device «CARDIODE» in patients with various forms of destructive appendicitis by analyzing the hydrodynamic of blood flow in the and third mode according to the method Poedintsev-Voronova.

3) to evaluate the diagnostic significance of disorders of the central hemodynamics in patients with destructive forms of appendicitis.

MATERIALS AND METHODS

From 2012 to 2016 in a surgical hospital of children surgery department

of The Regional Children's Clinical Hospital №2 N.N. Burdenko Voronezh State Medical University 1405 children with destructive forms of appendicitis, of which 115 with appendicular peritonitis (8.2 %) were hospitalized.

The present study was based on the observation and treatment of 74 children with destructive forms of appendicitis. Among them 36 patients with an acute phlegmonous appendicitis (I group) and 38 children with appendicular peritonitis in age from 3 to 17 years (II group). Also the study included 60 healthy children in age from 3 to 17 years (III group).

During the hospital stay for all children was conducted clinical and laboratory examination. We have carried out the assessment of the severity of the condition of children admitted to hospital, the need of preoperative preparation, the nature of operative treatment, duration of stay in the intensive care unit, the timing of drainage, laboratory values, bed days.

To determine the central hemodynamic parameters we used a certified device «Cardiocode» hemodynamic analyzer computer, based on the method Poedintsev-Voronova (patent No. 94031904/14(029471) from 5.08.1994).

ECG and rheogram were recorded simultaneously with the help of computer analyzer «Cardiocode». Then by the developed program, using the duration interval of the QRS, RS, PQc, QT, QTc, TT V and VI or II leads, calculated are the following parameters

UO (ml) - stroke volume;

IOC (ml) = UO x heart rate - cardiac output;

Ve.d. (ml) - volume of blood entering the left ventricle in a phase of slow filling, in result of the action of the suction function of the ventricle and the venous inflow (early diastole);

Vs.a. (ml) - volume of blood entering the left ventricle in the phase of systole of

the atria that characterize the contractile ability of myocardium of the left atrium (atrial systole);

In addition, diastolic volume-phase parameters $V_{e.d.}$ and $V_{s.a.}$ characterize the level of preload;

$V_{r.e.}$ (ml) - volume of blood ejected by the left ventricle in the rapid ejection phase (quick expulsion);

$V_{s.e.}$ (ml) - volume of blood ejected by the left ventricle in a phase of slow ejection (slow expulsion);

Systolic volume-phase parameters $V_{r.e.}$, $V_{s.e.}$ characterize the contractile ability of myocardium of the left ventricle;

$V_{t.a.}$ (ml) - volume of blood pumped by the ascending aorta as peristaltic pump (a phase of slow exile) and thus reduces the afterload of the left ventricle. The indicator characterizes the tone of the ascending aorta.

In addition, for an objective assessment of the obtained results, we conducted study in healthy children of different ages. We studied parameters of central hemodynamics in 60 healthy children in age from 3 to 17 years.

In patients with destructive forms of appendicitis central hemodynamic parameters were recording at admission to the hospital (before surgery), and then daily until discharge.

THE RESULTS AND DISCUSSION

36 children of the group I with destructive appendicitis, entered the first day from the onset of the disease, their condition was characterized as moderate. The increase in heart rate was noted, but the systolic and diastolic blood pressures were within normal figures, ECG without pathology. In the examination of children of this group by the device «Cardiocode» the disorders of the central hemodynamics was diagnosed in 14 (39%) patients which consists of reducing the volume of blood entering the left ventricle in the early diastole phase $V_{e.d.}$ (up to 20-25% of normal), increase in the volume of blood entering the left ventricle in systole of the atria $V_{s.a.}$ and tone of the ascending aorta, operating as a peristaltic pump $V_{t.a.}$ (up to 20-25% of normal), which recovered by 3 day after those appendectomy. While 10 (28%) patients were found with normal systolic and diastolic parameters of central hemodynamics, the index of $V_{t.a.}$ (up to 10-15% of normal) was recovered within a day after surgery.

38 children of the group II with destructive appendicitis complicated by peritonitis were admitted to hospital in a serious condition. ECG without pathology. Examination of children of

this group by the device «Cardiocode» revealed in all patients disorders of the central hemodynamics, which consists of reducing the volume of blood entering the left ventricle in the early diastole phase $V_{e.d.}$ (up to 35-50% of normal), increase in the volume of blood entering the left ventricle in systole of the Atria $V_{s.a.}$ and tone of the ascending aorta, operating as a peristaltic pump $V_{t.a.}$ (up to 35-50% of normal), despite of intensive therapy in most patients, these parameters slowly recovered only to the time of discharge from the hospital.

In 60 healthy children of the group III violations of the parameters of central hemodynamics were not revealed.

CONCLUSIONS

1. In hospitalized children with abdominal syndrome in a surgical hospital of children surgery department of The Regional Children's Clinical Hospital №2 N.N. Burdenko Voronezh State Medical University from 2012 to 2016 appendicular peritonitis was found in 8.2 % of cases.

2. In children with various forms of destructive appendicitis and appendicular peritonitis, recorded a significant decrease in the volume of blood in early diastole ($V_{e.d.}$) (up to 35-50% of normal) and a compensatory increase in the flow of blood in systole of the Atria ($V_{s.a.}$), and also revealed an increase of the tone of the aorta ($V_{t.a.}$).

3. Estimation of parameters of central hemodynamics by Poedintsev - Voronova method with the help of the device «CARDIOCODE» is the most informative in comparison with ECG and allows in the first minutes of admission of patient to diagnose CH disorders in children with peritonitis and effectively maintaining rational intensive therapy.

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COMPARATIVE ANALYSIS OF VARIOUS TYPES OF IMPLANTS FOR THE CORRECTION OF EXTENSIVE DIAPHRAGMATIC DEFECTS

ABSTRACT

The study reports the results of the comparative analysis of treatment of patients with congenital diaphragmatic hernia (CDH), performed between 2008 and 2015. The surgery was performed on 169 newborns at the Filatov Hospital in Moscow. Diaphragmatic plastic was performed mainly using thoracoscopy and in most cases the defects were corrected using the patient's own tissues. In cases where it proved impossible to fully correct a defect by the patient's own tissues, implant materials were utilized. Thoracoscopic diaphragmatic dome plastic procedure involving a use of the implant material was performed on 42 children. We conducted a comparative analysis across the surgeries using synthetic and biological implants. The research showed the benefits of the biological implant. Using that type of material allows the surgeon to achieve correction of CDH in aplasia of the dome of the diaphragm; the follow-up with patients confirmed that the results were maintained over the long term.

Keywords: congenital diaphragmatic hernia, implants, newborns, malformation, thoracoscopy.

INTRODUCTION

Congenital diaphragmatic hernia (CDH) belongs to a type of malformations in compatible with life in absence of surgical correction. Lately, we have been seeing the increase in promise of mini-invasive surgery in newborns, but at the same time, a number of questions in treatment of CDH remains unresolved. Thus, more research is required to significantly improve the outcomes of diagnosis and treatment of congenital malformations in children. However, the extant literature focuses on the description of individual cases of treatment of newborns with CDH by endoscopic approach, which limit our understanding of the way to properly select the method of surgical intervention, and the feasibility of performing endoscopic surgery for large diaphragm defects. To date, neither the indications, nor the technique of endoscopic treatment, nor the types of prosthetic materials for infants with large defects of dome have been fully discussed. Reliable conclusions can only be drawn on the basis of many years of observations of the outcomes of treatment of this pathology, while other variables (e.g., a specific medical facility) being held constant.

Objective - to examine the results of using different types of implants in the correction of congenital diaphragmatic hernia in newborns.

MATERIALS AND METHODS

Between 2008 and 2016 169 newborns with CDH were admitted to the Filatov Hospital in Moscow. Thoracoscopic diaphragmatic dome plastic surgery was performed on 42 children, using implant materials. Two comparative groups were created according to the type of implant

material. The first group was made up of 14 (33%) newborns with CDH who were operated using synthetic material Ecoflon. The second group included 28 (67%) newborns that were operated by using of biological material Permacol. All children were full-term with the average body weight more than 3 kg. In most cases included congenital heart diseases, genetic malformations and extra pulmonary sequestration in one case from the second group (table 1).

Ecoflon synthetic material in Russia was created based on polytetrafluoroethylene by specialists of the Scientific-production complex «Ecoflon». First it was applied in 2008 for thoracoscopic access. The thickness of the implant is 1 mm, and it has two functionally different surfaces: microporous surface prevents the formation of adhesions with abdominal viscera and macroporous surface which initiates growth and development of fibroblasts (Fig. 1). The patch was immersed to the pleural cavity through a slit in a spot fixing of one of the trocars; the patch was fixed along the perimeter of the defect by interrupted stitch.

The biological material «Permacol» (porcine dermal collagen; Tissue Science Laboratories, Great Britain), which was used for the defect closure for the patients in the second group. It is made of pig skin, and represents a pure cross-linked collagen and elastin devoid of cellular structures and adipose tissue. The implant was first used in clinic in 2012. The material thickness is 0.5 mm. According to the manufacturer, this material does not have any antigenic properties. The collagen fibers are the framework for vascularization and germination by recipient tissues (Fig.

2). The implant patch was immersed through the channel of the trocar, fixed by interrupted stitch to the diaphragm, the lateral part of the defect, in the absence of the muscular layer, was fixed with single through stitches to the chest wall.

In the postoperative period the variables measured included: the duration of artificial lung ventilation (ALV), the duration of the hydrothorax, cases of chylothorax, start time of enteral load, cases of gastro-esophageal reflux (GERD), cases of relapse of CDH and the number of fatalities (table 2).

RESEARCH RESULTS

Comparative analysis of the intraoperative data patterns during endoscopic surgeries shows the advantages of using Permacol implant in reducing time of the operation. This is explained by the fact that this type of implant is inserted into the chest through the trocar channel. Considering that Ecoflon is thicker and has a lower compressibility, one of the working trocars needs to be removed to place it into the pleural cavity. The other factor that affects the time of the operation is the process of fixing the implant. Ecoflon has to be installed with the macroporous surface facing the thorax and the microporous one facing the abdominal cavity. At the same time Permacol has uniform surfaces and therefore it does not matter which side is facing the thorax of the abdominal cavity. From technical perspective Ecoflon's ability to absorb light create certain difficulties in visualization during the fixation of the implant.

During the postoperative care, all children received artificial lung ventilation before normalizing the cardio-respiratory

Comparative characteristics of children with CDH

Table 1

	1-st group (n = 14)	2-nd group (n = 28)	p-value
Sex (male/female)	8/6	12/16	-
Gestational age (weeks)	38,1±2,44 (min 33-max 41)	38,8±0,83 (min 37 – max 41)	p>0,05
Birth weight (g)	2880±645 (min 1950 – max 4300)	3378,1±473 (min 2580 – max 4600 r)	p>0,05
Age at the time of the operation (days)	2,7±1,84 (min1 – max7)	4±1,37 (min1-max9)	p>0,05
Comorbidity	3 (19)	6 (25)	p>0,05
Antenatal diagnosis	13 (81)	20 (83)	p>0,05

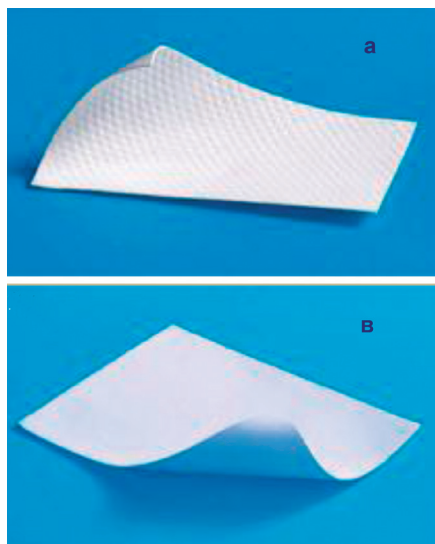


Figure 1 a, b Synthetic implant «Ecoflon», Russia (a – macroporous surface, b – microporous surface)

status and restoring independent breathing (Table 2). The average duration of the artificial lung ventilation in both groups had approximately the same duration. However, for the patients of the second group high-frequency artificial lung ventilation was more common, which indicates a more severe cardio-respiratory status.

One of the complications of the postoperative period is a chylothorax. One of the drivers of that complication could be a pressure increase in the system of the superior vena cava due to



Figure 2. Biological implant Permacol (Tissue science laboratories, UK)

high pulmonary hypertension. The other possibility is to view chylothorax as a response to the inflammatory process. In any case, the predecessor of chylothorax is hydrothorax, the duration of which depends on the degree of hypoplasia of the lung tissue. Comparative analysis (Table 2) revealed that in the early postoperative period chylothorax occurred in two groups with the same frequency. In all cases, chylothorax treatment was started with the conservative therapy. It should be noted that for patients of the second group in three cases (12%) the duration of the drug administration was more than 3 weeks, whereas in the first group only one patient (6%) required a 3-week injection of sandostatin.

An important indicator of the postoperative treatment of patients with the congenital diaphragmatic hernia (CDH) is the onset of enteral load and the ability to feed a child with age-appropriate

volumes. Data of the Table 2 testify that the patients of the second group started enteral feeding significantly earlier than patients of the first group. One of the possible explanations was lack of the inflammation markers in the laboratory results.

Gastroesophageal reflux (GERD) occurs as a result of stretching of the esophageal hiatus while performing the plastic dome. This complication occurs with the same frequency across both groups. Our study showed that GERD that happens after the plastic repair of the hiatus is tolerant and requires surgical correction, and patients undergo the laparoscopic Nissen fundoplication.

The technique of suturing when closing the defect of the diaphragm did not radically change in the transition to endoscopic methods of correcting the congenital diaphragmatic hernia, although certain difficulties may arise when there is a considerable tension or a pronounced deficit of the diaphragm's own tissue. In such cases a thorough dissection of the existing muscle rolls, due to which an additional mobility of the dome is created during the child growth, is necessary. The problem of diaphragm rupture at the place of suturing and the occurrence of replaces has not lost its relevance though. Another problem that can arise from the implanted material side is the infection in the area of the through-seams. Comparative results of

Table 2

Comparative results of treatment children with CDH using implants «Ecoflon» and «Permacol»

	1-st group (n = 14)	2-nd group (n = 28)	P-value
Operation time (min.)	144 ± 28 (min 100 - max 180)	106 ± 10 (min 95 – max 126)	p<0,05
Duration of mechanical ventilation (hours)	15,4 ± 8,8 (min 4 – max 46)	16 ± 7,4 (min 6 – max 42)	p>0,05
High-frequency oscillatory artificial ventilation (patients)	2 (4,7)	8 (19)	p>0,05
Duration of hydrothorax (hours)	14,6 ± 2,8 (min 4 – max 27)	14,7 ± 2,8 (min 4 – max 37)	p>0,05
Chylothorax (patients)	4 (9,5)	5 (11,9)	p>0,05
Enteral loading (days)	12,9 ± 2 (min 2 – max 15)	5,1 ± 2 (min 2 – max 11)	p<0,05
Gastroesophageal reflux (patients)	4 (9,5)	7 (16,6)	p>0,05
Recurrence (patients)	6 (14,2)	6 (14,2)	p>0,05
Implant rejection (patients)	2 (4,7)	0	p<0,05
Mortality	5 (11,9)	7 (16,6)	p>0,05

the condition of implanted materials of our patients are shown in Table 2. Clinically, the relapse of CDH was indicated by an increase in respiratory failure and symptoms of dysphagia. However, for the purpose of monitoring and detecting relapses that are not accompanied by clinical symptoms, all patients underwent chest X-ray examinations at 1, 3, 6, and 12 months. In doubtful cases, multispiral computer tomography of the abdominal and thoracic cavities was also performed. To confirm the diagnosis repeated surgery was performed. As can be seen from the table, there is no statistical difference in the incidence rate of relapse of the disease depending on the implant material. In the first group of patient infectious complications were revealed in 2 cases. A rejection reaction was noted after 2 and 3 months after the plastic repair of the diaphragm. Clinically, it was manifested by the appearance of granuloma on the lateral surface of the chest in the place of application of the through-seam. Both children had granuloma and ligature removed, but the inflammatory process persisted, which then became an indication for the surgery. During the examination through the incision in the thorax, it was revealed that the bottom of the fistula was an implant. The latter was removed without hindrance from the chest cavity. Macroscopically, no changes in the material were detected.

The main result of the treatment of patients with CDH is a discharge from the hospital. To date there is still no 100% survival rate with such pathology (Table 2).

Fatal outcome was observed in 15 newborns. As can be seen in Table 2, there is no statistical difference in the lethal case incidence between the types of the implanted materials. This once again shows that the postoperative lethality is caused by the presence of a defect in the diaphragm, and the severe cardio-respiratory status of these patients, not suppressed by pulmonary hypertension, as a result of lung hypoplasia and the onset of a general infection.

DISCUSSION

The situation where CDH is in the closure of the diaphragm defect presents a particular challenge for the surgeon. The greatest difficulty with the plastic procedure occurs with aplasia dome of the diaphragm [1]. Nowadays thoracoscopy is a preferred solution, but there are several issues in the treatment of children with aplasia of the dome of the diaphragm. Selection criteria for neonatal endoscopic surgery was proposed in

the research of Okazaki T.: location of stomach and liver in the pleural cavity; absence of hiatal hernia; assisted ALV with pressure of the breath not more than 24 mm Hg. St.; stable cardiopulmonary status for 10 minutes in sideways position [5]. According to other authors, despite the progress of minimally invasive surgery, the best surgical way for CDH remains laparotomy, considering the recurrence rate of CDH is higher with endoscopic procedures [5]. The paper by P. Szavay [6] reported a significant number of recurrences after thoracoscopic treatment (5 of 21; 23.8 per cent). According to other authors, relapse in the treatment of CDH in newborns remain at the level of 26.3% [4,12]. Research by K. Tsao discussed the data of 93 health centres, where the recurrence rate was 2.9% (126 out of 4390 patients) [7]. A high percentage of relapse was observed in the group of children who were operated by thoracoscopic access [2].

The problem of choice of method to close the defect of the diaphragm with a lack of its own tissues still remains [3]. The analysis application of implant materials in primary plastic aplasia dome of diaphragm in children [4] shows that synthetic absorbable materials was used in 62.1% cases, biological - 25.9%, not absorbable composite materials - 11.7%. Synthetic material GoreTex® implant and biological Surgisis® (68%) were applied most frequently. Using composite absorbable implants led to recurrence (relapse) in 100% of cases [4]. Biological materials caused recurrences in 30.9% of cases, Permacol™ material had the smallest number of relapses (11.1%) identified in the diaphragmatic plastic. But according to most authors, despite of the results of the experimental researches, the main complication in use of biological implants in practice is an infection, inflammation of the soft tissues in implantation area [4]. This is probably caused not only by material properties but also by characteristics of conservative therapy in the postoperative period.

CONCLUSIONS

1. Thus, several observed variables, such as survival, number of relapses and occurrence of gastro-esophageal reflux, have not revealed statistically significant differences in the use of synthetic or biological implants.

2. Analysis of data showed the advantages of a biological implant «Permacol» over synthetic material «Ecoflon» performing the surgery of large defects of the dome of the diaphragm such as reduced operating time, reduced time before enteral load and the lack of

inflammatory changes by the implant.

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MATERIALS OF THE REGULAR ISSUE

ORIGINAL RESEARCHES

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SPINOCEREBELLAR ATAXIA TYPE 1 AND PERSPECTIVE OF THERAPY

ABSTRACT

Yakutia is an adverse region in the epidemiology of the autosomal dominant form of spinocerebellar ataxia type 1 (SCA1). Over the past 21 years, the number of carriers of the SCA1 mutation in the Republic Sakha (Yakutia) has reached 46 cases per 100,000 people of the Yakut population and is the highest in the world. Currently, there are no known effective methods of pathogenetic treatment. In general, symptomatic treatment of clinical manifestations of SCA1 is practiced. The article briefly describes the main results obtained to date in the world, on the disclosure of the molecular mechanism of the pathogenesis of SCA1 and ways to find promising means for the treatment of this disease.

Keywords: spinocerebellar ataxia type 1, pathogenesis, Purkinje cells, ataxin 1.

Introduction

Yakutia is an adverse region in the epidemiology of the autosomal dominant form of spinocerebellar ataxia type 1 (SCA1). Over the past 21 years, the number of carriers of the SCA1 mutation in the Republic has reached 46 cases per 100,000 people and is the highest in the world [2]. Currently, there are no effective methods of pathogenetic treatment. In general, symptomatic treatment of clinical manifestations of SCA1 is practiced. The solution of medical and social problems of patients with SCA1 and the prevention of new cases is one of the urgent tasks of public health in the Republic Sakha. What are the prospects for treating this disease?

The mutation of SCA1 was identified 24 years ago by Huda Zoghbi (1993) in the laboratory of medicine and pathology of Professor Harry Orr in Medical School of the University of Minnesota. Currently, these researchers continue to study the molecular mechanisms of the pathogenesis and pathophysiology of the disease in order to search for innovative therapeutic developments. The scientific interests of these studies are related to the solution of the following issues: the molecular basis of the specificity of the pathology (atrophy of Purkinje cells), the mechanism of «distortion» of the function of the normal ataxin protein by the polyglutamine fragment, and the basis for the development of the risk of ataxia with increasing age of the organism. This article briefly describes the results of the main works and achievements of these authors in revealing the mechanism of the pathogenesis of SCA1 and the ways of finding promising means of treatment.

Molecular mechanisms of the pathogenesis of SCA1

The study of the genetics of autosomal dominant SCA1 began in the mid-1970s when the gene associated with this pathology was first identified. As genetic technology developed, this gene was cloned (1993) and its structure studied [5]. Ataxin1 protein product is produced in many neurons of the brain, but Purkinje cells of the cerebellum are the most vulnerable to pathogenesis. This explains the clinical phenotype of the disease, selectivity of defeat and atrophy of Purkinje cells. Ataxin1-polypeptide composed of 816 amino acids. Studies have identified several structural elements of this polypeptide that are directly related to the function of protein in the body and its role in the pathogenesis of SCA1. First of all, an N-terminal sequence having a polyglutamine peptide fragment (up to 30 amino acids) with an insert inside the peptide of one or two amino acids of histidine. The mutant polypeptide does not have histidine inserts and is extended to 40-75 amino acids glutamine. The beginning of the debut of the disease depends on the length of the glutamine repeat. Genetic studies have shown that extended glutamine repeat in the gene of SCA1 enhances the function of this gene. This was proved on the model of a mutant mouse with loss of function of ataxin1 protein, where the clinical phenotype of SCA1 in mice does not develop. However, these mice show a memory deficit (skills acquired by Purkinje cells), which indicates the important functional significance of the organism's ataxin1 protein in the formation of memory of coordination of motor functions of the organism [4]. Thus, the pathogenesis of SCA1 is determined by the toxic effect of the

enhanced function of normal ataxin1 due to elongation of glutamine repeats. The studies revealed the main function of the gene in the body - the function of the transcription factor, in combination with other nuclear proteins it regulates the induction of gene expression responsible for the development of Purkinje cells. It was further shown that other structural elements of the polypeptide chain of this multifunctional protein have a modifying effect on the toxicity of this protein. These include the evolutionarily conserved AXH region (120 amino acid fragment) involved in the formation of a transcriptional complex with other proteins and regulation of gene expression. Another fragment of the polypeptide sequence determines the localization of ataxin binding in the nucleus of the Purkinje cell and the amino acid serine (776 position in the protein chain) phosphorylated by cellular kinase. Researchers also discovered the existence of adaptive dynamic changes in the morphology of Purkinje neurons for maintain the equilibrium of excitation functions (homeostasis) and the density of ion channels in the cell membrane. With excess excitation, parts of the dendritic branches of the neuron are removed (as temporary atrophy). This mechanism of maintaining equilibrium has its limits and the consequences of a change in the intensity of transcription, exceeding the equilibrium limit, lead to pathogenetic atrophy. This physiological feature of the neuron explains the late age onset of symptoms of SCA1. With age, the secondary process of atrophy is clinically manifested. This process allows to maintain vital for the physiology of Purkinje cells functions against the background of irreversible redundancy

and toxicity of transcription products of genes. This leads to an irreversible process of eliminating the branching of the neuron dendrites and further atrophy of the cell and tissue of the cerebellum. Thus, excessive expression with an «incorrect» function of ataxin 1 induces a number of toxic consequences for the Purkinje cell [3]. Studies on mouse models show an experimental possibility to weaken or eliminate toxicity of ataxin and the clinical phenotype of SCA1 by blocking the functioning of the above structural sections of ataxin protein 1. Investigations of the molecular mechanisms of the functioning of these sites open up new possibilities for finding promising directions from the point of view of therapy. The knowledge obtained in molecular genetic studies of this multifunctional protein is the basis for developing innovative approaches in the prevention and therapy of this disease. What are the ways, level and degree of development of these studies?

Approaches for the search for promising ways to treat spinocerebellar ataxia

Innovative developments are the result of using the knowledge of the molecular mechanism of the pathogenesis of the disease and are aimed at modifying the toxic effect of ataxin1 (attempts to change). These are the search for factors that inhibit gene expression at the level of transcription regulation, the process of chromatin decondensation, the translation of ataxin mRNA, as well as preventing the assembly of the protein molecule, its aggregation and toxic deposition.

The most promising approaches are: work with microRNAs to modulate protein synthesis, use chaperones to optimize assembly, protease inhibitors inducing apoptosis of neurons, work on the use of stem cells to repair brain tissue. Traditional searches of effective low-molecular chemical substances acting as cofactors of enzymes and stabilizers of multicomponent functional systems (derivatives of amino acids and carbohydrates) are also continuing to remove the severity of individual symptoms of the clinic of SCA1 [1]. Analysis of the mechanism of the pathogenesis of ataxia shows that the neurodegeneration of SCA1, carried out by ataxin 1 induces different pathological pathways. Therefore, effective treatment is possible with the combination of several therapeutic directions aimed at correcting different pathways of the disorder. In general, despite the great intellectual efforts of researchers, there seems to be a long way to find effective ways of pathogenetic treatment.

This work was supported by the Ministry of Education and Science of the Russian Federation (Project No. 17.6344.2017/8.9).

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RISK FACTORS FOR OSTEOPOROSIS AS MAIN PREDICTOR OF FRACTURE PROGNOSIS

ABSTRACT

In order to determine the most significant risk factors for osteoporosis (OP) in individuals living in the Arctic region, bone mineral density (BMD) was studied using the GE Lunar Achilles ultrasound densitometer and a questionnaire was conducted for men and women of different age groups.

The study revealed a decrease in BMD (below the expected age norm) in the age group up to 50 years, and at the age of 50 and older - osteoporosis and osteopenia in more than half of the subjects. Low-energy fractures were more frequent at the age of 50 years and older, that indicates severe forms of osteoporosis in these individuals. The use of dairy products was a significant risk factor for OP, as patients with fractures used dairy products less frequently than people without fractures ($p < 0.05$). Thus, it was found that inadequate consumption of dairy products, age, early menopause, history of a fracture are the main risk factors for OP, significantly affecting the density of bone tissue and the frequency of low-energy fractures.

Keywords: risk factors, osteoporosis, fractures, mineral density of bone tissue.

INTRODUCTION

Osteoporosis is a multifactor disease accompanied by reduction in bone mineral density and strength, which together increases the risk of fractures [4]. In recent years, interest in the problem of osteoporosis is steadily increasing due to both the ever-growing incidence of this disease, and the high cost of treatment (OP) of osteoporosis and its complications such as bone fractures. According to the Russian epidemiological studies, in the age group over 50 years more than 10 million people are diagnosed with osteoporosis: in 30-33% of women and 22-24% of men [1]. Diagnosis of osteoporosis, especially early, is difficult due to the lack of specific clinical signs of the disease. Fractures occurring against the background of osteoporosis are late clinical manifestations of the disease. X-ray signs of osteoporosis in the form of vertebral deformations also indicate a significant loss of bone mineral density (BMD). Along with this, in the light of modern data X-ray absorptiometry (DXA) cannot be considered the only basic diagnostic method, and the BMD indicator, determined with its help is considered to be only one of the risk factors for fractures.

In this regard, knowledge and consideration of risk factors becomes particularly important for the prevention and diagnosis of the disease. We need targeted identification of patients with risk factors for osteoporosis and fractures for organization of prevention or formation of risk groups for further examination for the diagnosis or ruling out of osteoporosis [5].

Prior fractures and age are predictors of fractures, regardless of bone mineral

density [2]. History of prior fracture occurring with minimum trauma is the most significant OP and osteoporotic fractures risk factor, having even greater importance than BMD [2]. Low-trauma fractures are fractures that occurred spontaneously or when falling from one's own height or below, and also in a situation where the patient's roentgenogram has a compression fracture of the vertebra, regardless of whether the symptoms of compression are detected or not. In people with a fracture in any location, risk of subsequent fracture is 2.2 times higher than in those without prior fracture [6]. For the prediction, the number and location of the fractures are important. Thus, previous vertebral fractures increase the risk of subsequent fractures by more than 4 times, and also become predictors of fractures in other locations, including the femoral neck. Along with that forearm fractures can be preceded by vertebral and hip fractures, and previous hip fractures increase the risk of subsequent fractures in this location [6].

BMD decrease begins from 45-50 yrs, but significant increase in risk of OP is associated with the age of 65 years and older [6]. Therefore, ages of 65 years and older should be considered a predictor of bone fracture [1, 8]. It should be noted that even such a factor as low BMD correlates with this age group. For example, with a 75-year-old male with low BMD risk of OP was significantly higher than with a 55-year-old male with the same BMD [8]. Low BMD is one of the most important risk factors of OP [3].

Women have a higher risk of developing OP. This is due to specifics of hormonal state, as well as with smaller bone sizes and smaller total bone mass

[1, 6]. In addition, women lose bone mass faster and in greater numbers due to menopause, another thing is greater life expectancy [1]. For example, bone loss in women is 0,86-1,21% per year in different parts of the skeleton, while in males it is only 0,04-0,90% [6]. In this case, female sex can be attributed to risk factors for both OP and bone fractures (proximal femur and distal forearm) due to "worse" geometry of the corresponding sections of the skeleton in women. For example, in men, the neck of the hip is shorter, and the CCD angle is greater. However, OP is a significant problem for both sexes [1].

It is advisable to actively identify risk factors for osteoporosis and fractures due to their cumulative effect with increasing number and combination in one patient. The use of a set of validated factors associated with an increase in the probability of fractures allows the physician to form risk groups and take diagnostic and prophylactic measures, with possible correction of the modifiable conditions, as well as to estimate the threshold levels of drug intervention based on clinical judgment even when X-ray densitometry is not available.

Objective: to identify the most important risk factors for osteoporosis, taking into account gender differences and past medical history of fractures, in people living in the Arctic region.

MATERIALS AND METHODS

We conducted a survey to identify possible risk factors for disorders of bone remodeling in patients living in the RS (Ya). The research involved 430 people, including 319 women and 111 men aged 16 to 83 years. The ratio of men to women was 1:2.8. The patients were

divided into two groups; Group I – ages 50 and younger, Group II – ages 50 and older.

All survey members completed a questionnaire of the “National Program for Identification of the Main Risk Factors of OP and Bone Fractures in the Russian Population”, which takes into account age, preceding low-energy fractures, heredity (low-energy fractures in first-degree relatives), systemic administration of glucocorticoids (5mg or more of prednisolone for more than 3 months), hypogonadism in men and women (the latter experiencing early menopause before the age of 45), smoking, insufficient intake of calcium, excessive alcohol consumption (more than 36 ml in terms of pure ethanol), the presence of secondary causes for OP development (rheumatoid arthritis, type 1 diabetes, hyperthyroidism, chronic liver disease). Study of bone mineral density was performed using peripheral ultrasonic densitometer GE Lunar Achilles (Table 1).

In order to interpret the results, the densitometry classification of WHO was used in estimating the BMD values in postmenopausal women and in men aged 50 and over. According to the recommendations of WHO (1994), the results of densitometry were evaluated as: “normal” with T-test value of +2.5 SD to -0.9 SD from peak bone mass; “osteopenia” with T-test value of -1.0 SD to -2.4 SD; “Osteoporosis” with T-test value of -2.5 SD and less. “Severe OD” was classified as values of T-test of -2.5 SD and lower with past history of one or more fractures.

The results were processed using Microsoft's programs Office Excel and statistical data processing programs.

RESULTS AND DISCUSSION

The conducted survey revealed that of the women surveyed early menopause (up to 45 yrs.) was found in 13.1% of cases (n -42), that is higher than data of a number of authors, thus marking an increase in the number of women with early menopause.

Smoking and excessive alcohol consumption (no more than 3 daily intakes according to WHO criteria) were detected in 4.4% (n -19) surveyed, only in 10% of cases with women (n-2) and in 90% (n-17) of cases with men.

Rheumatic diseases and history of diabetes as a risk factor for osteoporosis occurs in 10.6% and 6.9% of subjects, respectively. Thyroid disease was found in 3.0% of the subjects. A person gets 70-80% of calcium from dairy products that contain other components, such

as phosphorous and magnesium, positively influence the bone remodeling process [5, 7], the basic milk proteins [10], phosphoproteins from casein and estrogens [9].

The use of dairy products as a source of nutritional intake of dietary calcium was 98.1%, of them 10.9% consume dairy products once a week, 50% - 2-3 times a week, and 39.0% - 4-5 times a week. Among the surveyed 15.3% (n -66) already had a low-energy fracture (Tabl.2), and 74% of cases (n-49) of the fractures were observed in the age group of 50 years and older, indicating possible severe forms of osteoporosis, which has to be treated to prevent repeat fractures.

In Group I we examined 142 people including 38 men and 104 women, 23.3% of the cases showed decrease in bone mineral density below the age indicators. In women, the decrease in the detected changes in bone density was at 19.7%, while for men it was 3.5% ($p < 0.05$). Risk factors for men – dairy products consumption of 2 times a week or more in 100% of cases, with women in 89.4% (10.6% of women do not consume dairy products). 11 (28.9%) men had a history of fractures in different locations, as well as 6 women (5.7%). Thyroid disease was identified in 31 (29.8%) women and 3 men (10%). Early menopause before the age of 45 was detected in 14 (13.4%) women of this age group.

In Group II we examined 288 people, including 73 men and 215 women. Risk factors for men - consumption of dairy products 2 times a week or more in 79.4%, and 89.4 in women (19.1% of men and 8.8% of women use dairy products once a week or less). In men, the bone mineral density within the age norm was found in 49 people, which was 67.1%, while for women this ratio was only 84 (39%). Osteopenia in men was observed in 19 (26%) men, in women – 97 (45.1%). Osteoporosis in 5 (6.8%) men and in 35 (16.2%) women. 17 (23.2%) men had a history of fractures in different locations, from fractures in women's history occurred in 32 (14.8%). Thyroid disease was found in 71 (33%) women and 5 men (6.8%). Early menopause before the age of 45 was found in 75 (34.8%) women in this age group.

CONCLUSION

Thus, age, decreased bone mineral density, early menopause, past history of fractures and inadequate consumption of dairy products are currently the major risk factors for osteoporosis and fractures.

Table 1

Mineral density of bone tissue depending on gender differences and age group

Age	Gender	Norm	Osteopenia	Osteoporosis	Total
up to 50 years	Men	33	5	0	38
	Women	76	26	2	104
Subtotal		109	31	2	142
50 years and older	Men	49	19	5	73
	Women	83	97	35	215
Subtotal		132	116	40	288
Total		242	147	42	430

Low-energy fractures in older age groups suggest severe osteoporosis and the need for therapeutic and preventive measures for the prevention of future fractures.

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Table 2

Low-energy fractures

Age	Gender	Total	Fractures
up to 50 years	Men	38	11
	Women	104	6
Subtotal		142	17
50 years and older	Men	73	17
	Women	215	32
Subtotal		288	49
Total		430	66

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THE IMPACT OF ONE-TIME EXPOSURE TO COMBINED STRESS ON THE NEURONAL PARAMETERS OF NEOCORTEX AND HIPPOCAMPUS OF OLD RATS

ABSTRACT

The purpose of this study is to assess morphological and morphometric parameters of the neocortex and hippocampus neurons of old rats exposed to one-time combined stress. Experimental rats were divided into 2 groups: male old intact and male old rats. The last group exposed to the one-time combined attack of noise, light and immobilization for 1 hour. Experimental materials were taken by decapitation, on the 7th day in the morning hours. We figured out that the influence of combined stress enhances significantly the process of neuronal death in the neocortex of the aging animals' brain. Morphological changes are manifested by increasing number of hyperchromic neurons, vacuolization and increasing cell cytoplasm's area. In the hippocampal neurons of the CA1 area morphological changes were not detected.

Keywords: neurons, morphometry, stress, neocortex, hippocampus, ageing.

INTRODUCTION

For centuries, scientists from various fields pay their attention on the problem of ageing. There are several theories about the development of aging, but now the most widely accepted is the free radical theory. According to this theory, a change in the balance between the intensity of free radical formation and antioxidant protection is the main universal mechanism of aging and damage to living systems [1,5]. It is also known that during the process of age involution resistance to stress factors naturally decreases [1,4]. There are data that stress-induced effects lead to intensification of lipid peroxidation and development of oxidative stress in the brain [2,3]. It leads to damages and death of neurons through apoptosis or necrosis. At the present time, the role of stress factors in the formation of age-

related changes in the morphology and metabolism of neurons are not well known, therefore this is of significant interest.

The purpose of this research is to study the morphological and morphometric parameters of neocortex and hippocampus neurons of old male rats exposed to one-time combined stress.

MATERIALS AND METHODS OF THE RESEARCH

In the research we used old (20-24 months) male white rats, weighing 350 – 400 g (n = 10). Animals were divided into 2 groups: 1 group – old intact (n = 5), 2 group – old rats, stressed one-time by combined exposure of noise, light and immobilization for 1 hour (n = 5).

The combined stress was modeled by placing the animals in a narrow plastic box with simultaneous exposure to white

noise and 100W light at a distance of 50 cm. The experiment was carried out under the conditions of a vivarium; the animals were kept in ad libitum conditions.

All procedures and manipulations on animals were carried out in accordance with the requirements of the European Convention for the Protection of Vertebrate Animals and the principles of the World Medical Association Declaration of Helsinki. Experimental materials were taken by decapitation on the 7th day in the morning hours.

The materials were fixed in a Carnoy's fluid. Sectioning tissues was made by standard paraffin method. The morphological study was carried out on sections (7 µm) of the parietal lobe, stained by methylene blue and hematoxylin-eosin. The program PhotoM1.21 was used for morphometric research. Statistical analysis of the

research data was realized using the program Statistica 10.

RESULTS AND DISCUSSION

During the morphological study, we found qualitative and quantitative differences from intact control group. In all cortical layers, we observed multiple hyperchromic neurons, whereas the morphological picture of the intact old rats' neocortex was characterized by just few number of hyperchromic neurons. Hyperchromic neurons with karyopyknosis and cytopsyknosis are perishing/pathologically altered neurons, reflecting the processes of natural vital activity and cell death. These neurons are deformed cells with irregular contours, often reduced in size, with wrinkled hyperchromic nucleus and cytoplasm, and characterized by a more intense staining than normal. Hyperchromic neurons did not form clusters and located among unchanged cells in all cortical layers. Also, among neurons of II-IV cerebral cortical layers of stressed rats, we observed a large number of cells with vacuolization, probably characterizing the malfunction of synthetic processes.

Only in the group of stressed animals we observed single cases of apoptotic bodies, as well as died cells with fragmented and deformed neurites. The received morphological data showed the increasing number of perishing/pathologically altered neurons under the influence of one-time combined stress, both in the mechanism of necrosis and apoptosis.

The hippocampus of the stressed group had a normal cytoarchitecture, the CA1 area included medium size pyramidal neurons. There were single hyperchromic cells, also areas of low spatial density of cells both in the intact control group and in the stressed group. Morphometric examination does not indicate credible changes in the areas of the cytoplasm and the nucleus of neurons. Degenerating neurons, related to irreversible changes, as well as decreasing their density, we characterized them as a progressive aging process that do not differ from intact control group.

The number of neurons in the external granular layer (II) has not identified changes from the control group, in the internal pyramidal layer (V) has shown an unreliable decreasing of the number of cells (13%) (Table 1).

Gravimetric and morphometric indicators of brain

Indicator	Group	
	1st group Old male rats (intact)	2nd group Old male rats (stressed)
Brain mass, mg	2170±14,4	2034±38,4
Brain hemisphere mass, mg	777±18,1	736±19,1
Number of neurons:		
- external granular layer (II layer)	12,4±0,51	12,0±0,44
- internal pyramidal layer (V layer)	6,0±0,31	5,2±0,37
Cross-sectional area, μm^2 ,		
- nuclei of neurons (II layer)	55,5±2,28	58,4±2,23
- cytoplasm of neurons (II layer)	44,2±1,68	54,4±2,41*
- nuclei of neurons (V layer)	102,3±3,54	108,3±4,47
- cytoplasm of neurons (V layer)	120,6±4,60	134,4±9,34
- nuclei of hippocampus neurons (CA1)	15,8±0,54	15,1±0,47
- cytoplasm of hippocampus neurons (CA1)	10,1±0,69	9,4±0,55

Note: * - differences are statistically confirmed in comparing to group 1.

Morphometric research of neurons in the II and V layers detected a reliable increasing of the cytoplasm area in the II layer for stressed group (up 22%) (Table 1). In addition, the morphometry data demonstrates in other layers a tendency to increase in size of nuclei and cytoplasm of neurons, but there are no statistically confirmed differences. Thus, the mean values of the nuclei of the II layer neurons increased by 5.4%, the nuclei and cytoplasm of V layer increased by 5.8% and 11.6%, respectively. We suggest these changes caused by destructive changes in neuronal organelles, mainly in mitochondrias, in endoplasmic reticulum and in the Golgi complex, due to intensification of lipid peroxidation.

CONCLUSIONS

According to experimental data we detected morphological changes, characterized by increasing number of perishing/pathologically altered cells in the neocortex. The most distinctive morphological changes are: hyperchromic neurons, vacuolization and increasing in the size of neurons cytoplasm in the external granular layer. Also we can mark unconfirmed increase of cells size parameters in other layers. In the hippocampus we observed degenerating neurons, reducing cells density in both groups. Thus, the stress significantly enhances the neurons death in the brain of aging animals and it is an important mechanism of nervous tissue damages.

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STRESS-PROTECTIVE AND ANTIOXIDANT EFFECT OF THE *Cimicifuga dahurica* (Turcz.) Maxim.

ABSTRACT

The stress-protective and antioxidant effects of *Cimicifuga dahurica* (TURCZ) Maxim tincture were estimated in the experiments on white *Wistar* rats. The stress-induced condition was simulated by immobilization of the animals for 18 hours. There was estimated the evidence of the Selye's triad (hypertrophy of adrenal glands, involution of thymus and spleen, and gastric mucous membrane ulceration, with determination of the Pauls index), the content of malonic dialdehyde (MDA) in the blood serum, activity of catalase in the blood serum and superoxide dismutase (SOD) in erythrocytes and the content of the reduced glutathione in the blood. It has been revealed that the *C. dahurica* tincture has a marked stress-protective effect, preventing hypertrophy of the adrenal glands, involution of thymus and spleen development of ulcerative lesions of the gastric mucosa. The *C.dahurica* tincture inhibits lipid peroxidation and activates the antioxidant system of the body in stress-induced conditions.

Keywords: *Cimicifuga dahurica* (TURCZ) Maxim tincture, immobilization stress, stress-protective and antioxidant effects.

INTRODUCTION

It is known that stress has a negative impact on the body, on mental activity and human behavior, up to their complete disorganization, and also leads to the emergence or aggravation of the course of neurotic, psychosomatic and organic diseases. In this regard, the prevention of stress and its consequences is an extremely urgent task. An important role in the treatment of stress-induced conditions is played by phytotherapy. To the means of vegetable origin, which have sedative effect and can be used to treat and prevent the consequences of stress, include *Valeriana*, *Leonurus*, *Crataegus*, *Passiflora*, *Melissa*, *Organum* and other plants.

In the treatment and prevention of stressful situations a promising plant is *Cimicifuga dahurica* (Turcz.) Maxim. The plant is widely used in the form of powder, tincture and liquid extract in folk medicine for headaches, the initial stages of hypertension, with increased nervous excitability, hysteria, insomnia, etc. [11]. In Tibetan medicine *C. dahurica* is included into the medicinal collections used for the treatment of gza diseases (diseases "inflicted by demons"). These diseases may be identified as insults, paralyses and other functional disturbances of the nervous system [10]. The *C. dahurica* tincture has a sedative effect limiting motility, exploratory activity and reflex excitability of animals and prolonging the narcotic sleep [6]. The anxiolytic, antidepressant and anti-aggressive effects of *C.dahurica* tincture it has been established in the experiments on white rats [2, 3].

The aim of the study was to estimate the stress-protective and antioxidant effects of the *Cimicifuga dahurica* tincture.

MATERIALS AND METHODS OF THE STUDY

The experiments were carried out on 32 white male and female *Wistar* rats weighing 160-180 g. The animals were kept in the standard vivarium conditions observing a similar care, nutrition, and light and temperature regimen according to the GLP rules (Order N. 708H dated 23.08.2010) and the "European Convention for the protection of vertebrate animals used for experimental and other scientific purposes" (Strasbourg, 1986). The test report was approved by the ethics committee of the Institute of General and Experimental Biology SB RAS (Report N. 3 dated 03.09.2012).

The animals were divided into 4 groups: intact, control and 2 experimental ones. The animals of the first experimental group received intragastrically the dealkurized solution of the *C.dahurica* tincture at a dose of 0.5 ml/kg in a volume of 1.0 ml/100 g (1 time per day 30 minutes prior to feeding) respectively for 7 days before simulating a stress-induced condition. The animals of the second experimental group were given a comparative preparation - valerian tincture (JSC Dalkhimpharm) in a dose of 1.0 ml/kg according to a similar scheme. The rats of the intact and control groups received the purified water in the same volume and introduction scheme. The immobilization stress was simulated by the standard method where the animals were fixed in the supine position for 18 hours [8]. The animals of the intact group were subjected no stress testing.

To estimate the anti-stress activity of the tested remedy the evidence of the Selye's triad was determined: hypertrophy of adrenal glands, involution of thymus and spleen, and gastric mucous membrane ulceration, with determination

of the Pauls [1]. The intensity of the lipid peroxidation processes was estimated by the increment of the peroxidation product – malonic dialdehyde (MDA) in the blood serum [9]. The state of the endogen antioxidant system was evaluated by the activity of catalase in the blood serum [4], superoxide dismutase (SOD) in erythrocytes [5], and the content of the reduced glutathione (GSH) in the blood [12].

The statistical processing of the obtained data was made with the use of "Biostat-2006" program pack and Student's t-criterion. The differences between groups compared were significant when $P \leq 0.05$.

RESULTS AND DISCUSSION

The findings have shown that the 18-hour immobilization of the animals causes the complex of pathological alterations characteristic of stress-reactions: hypertrophy of adrenal glands, involution of thymus and spleen, and presence of destruction in the gastric mucosa. Thus, in animals of the control group the relative mass of adrenal glands was 1.7 times higher than this index in animals of the intact group, the mass of the thymus and spleen was lower by 41% and 61% respectively (Table 1).

The *S.dahurica* tincture in dose 0.5 ml/kg has a marked stress-protective effect. Thus, in animals which received the *S.dahurica* tincture the relative mass of adrenal glands was 31% decreased, The relative mass of the spleen and thymus was 200% and 45% higher than this index in the control group. Along with this, the introduction of the *S.dahurica* tincture were decreased the development of deep destruction in the gastric mucosa of white rats. Thus, in animals of the experimental groups, point bleeding in the gastric mucosa were noted in only 5 animals

out of 8, whereas in the control group in 100% of the animals. The amount of data destruction was on average 3.0 times less than in the control, as a result of which the Pauls index for point bleeding in the first and second test groups was 5.7 and 4.8 times lower than in the control. In 50% of the animals receiving *C.dahurica* tincture, there were erosions, at 75% in the control group. In this experimental group the average number of destruction per animal was 3.0 times lower, and the Pauls index was 4.8 times higher than in the control group. Only a quarter of the animals in the experimental groups had banded ulcers; the Pauls index was 7.1 and 5.7 times lower, respectively, in the control group. The stress-protective effect of the *S.dahurica* tincture can be explained by the oxycinnamic acids entering into its composition [13]. Thus, according to the literature [7], ferulic acid has a pronounced stress-protective action, limiting the damage to the gastric mucosa and myocardial damage caused by immobilization-painful stress.

The results of the studies given in the Table 2 demonstrate that the immobilization stress is followed by activation of free radical oxidation as evidenced on the 53% increase in the concentration of this process product - MDA as well as the decrease of the activity in the enzymes of the bodily antioxidant protection i.e. 1.6, 6.6 and 1.2 times decrease of catalase, SOD and GSH respectively as compared with the indices in the intact group of animals. It has been established that the

course administration of the *S. dahurica* tincture and valerian tincture to animals decreases the MDA content on average by 24% and 30%, increases the catalase activity by 1.4 and 1.6 times, the content of GSH – by 30% and 21%, the activity of SOD – by 4.0 and 3.4 times respectively as compared with the indices in the control group of animals.

CONCLUSION

Thus, the data obtained have shown that the *C.dahurica* tincture on the background of the immobilization stress have stress-protective effect; it decreases the pronouncement of stress-induced alterations in animal inner organs. It has been established that the stress-protective effect of the tested remedy is due to its inhibiting influence on the processes of free radical oxidation and its capacity to activate the bodily system of antioxidant protection; it is due to the content of phenolic compounds and saponins exhibiting pronounced antioxidant activity in its composition [14].

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Table 1

The influence of the *Cimicifuga dahurica* tincture on the manifestation of degenerative alterations in inner organs of white rats in stress-induced injury

Indices		Animal groups			
		Intact (H ₂ O), n=8	Control (stress + H ₂ O), n=8	Experimental I (stress + <i>C.dahurica</i>), n=8	Experimental II (stress + valerian), n=8
Mass of organ, mg/100g	thymus	123,5±4,50	72,7±4,29	105,6±3,59*	108,2±1,97*
	spleen	521,0±16,45	204,6±18,63	432,5 ±20,06*	308,3±3,82
	adrenals	21,0±1,54	36,0±3,02	24,7±1,50*	28,3±0,77*
Point bleeding	Percentage of damaged animals	0	100	63	63
	Average number of destructions per animal	0	3,9±0,43	1,1±0,43*	1,3±0,44*
	Pauls index	0	3,90	0,69	0,82
Erosion	Percentage of damaged animals	0	75	50	63
	Average number of destructions per animal	0	1,9±0,55	0,6±0,29	1,0±0,47
	Pauls index	0	1,43	0,30	0,63
banded ulcers	Percentage of damaged animals	0	67	25	25
	Average number of destructions per animal	0	0,9±0,47	0,3±0,18	0,4±0,27
	Pauls index	0	0,57	0,08	0,10

Note: * – differences are significant in comparison with the data in animals of the control and experimental groups when $P \leq 0.05$; n – number of animals in the group.

Table 2

The influence of the *Cimicifuga dahurica* tincture on the lipid peroxidation processes in white rats and the state of their antioxidant system in stress-induced injury

Indices	Animal groups			
	Intact (H ₂ O), n=8	Control (stress +H ₂ O), n=8	Experimental I (stress+ <i>C.dahurica</i>), n=8	Experimental II (stress + valerian), n=8
MDA in the blood serum $\mu\text{mol/l}$	10,7 \pm 1,64	16,4 \pm 1,04	12,5 \pm 0,56*	11,5 \pm 0,43*
SOD in erythrocytes, act. units	13,1 \pm 1,28	2,0 \pm 0,30	8,0 \pm 0,51*	6,7 \pm 0,45*
Catalase in the blood serum, mkat/l	1,4 \pm 0,07	0,9 \pm 0,08	1,3 \pm 0,09*	1,4 \pm 0,11*
GSH in the blood, $\mu\text{mol/l}$	707,0 \pm 30,60	591,0 \pm 24,30	767,2 \pm 58,08*	715,0 \pm 78,77*

Note: * – differences are significant in comparison with the data in animals of the control and experimental groups when $P \leq 0.05$; n – number of animals in the group.

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METHODS OF DIAGNOSIS AND TREATMENT

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THE IMPLEMENTATION OF AN AUTOMATED DEVICE FOR HUMAN LIMB TEMPERATURE MONITORING AT TREATMENT OF COLD INJURIES

ABSTRACT

The article presents the device for automated temperature monitoring of human limbs. This device, called the «thermometric glove», was developed to be used in the treatment of cold injuries. The thermometric glove registers the surface temperature of the limb at several spots and performs an automatic recording of the readings to the internal memory. Two versions of the prototype devices and the results of approbation and experimental use are given.

Keywords: digital temperature sensor, portable controller, measurement of low temperatures, burn injury.

In the harsh climatic conditions of the Republic of Sakha (Yakutia), when the temperature reaches -60°C in winter, the problems associated with frostbite and hypothermia have an undeniable relevance. The greatest number of cold injuries compose those of the limbs. With severe cold injury of the limbs, it is necessary to maintain the condition of slow and gradual warming of frost-bitten tissues by means of natural heat exchange caused by the blood circulation for the maximum possible restoration of tissues. To do this, the injured limb is insulated as good as possible and various means are used to accelerate blood circulation. At the same time, the constant temperature monitoring of the object, namely the tips of the fingers, is of great importance. Such monitoring implies the use of reliable and accurate measuring equipment. Also, measuring the temperature of injured tissues is important for establishing an accurate diagnosis and determining the degree of frostbite, depending on which the method of first aid and medical care is chosen, which is decisive in treatment and determining the outcome of treatment [3]. The positive sides of this method include absolute harmlessness, the possibility of repeated, dynamic studies and the relative simplicity in the interpretation of the results obtained [1, 2]. In particular, a detailed study of the temperature changes in the tissues of the cooled segment makes it possible to diagnose the presence of tissues glaciation. In order to prove the presence of glaciation of tissues, it is necessary to confirm the negative temperatures in the tissues. Temperature control allows you to diagnose not only frostbite, but also diseases such as diabetes, mastopathy, adenoma.

The purpose of our development is the continuous periodic registering of the human fingertips temperature for a certain period of time, which will allow physicians to evaluate the effectiveness of certain techniques used in the treatment of such injuries. Since the patient must be able to move, the device must be autonomous and compact.

Based on the experience gained by NPO Etalon in the development of temperature monitoring systems for soils (Fig. 1), according to the technical requirements of the V.P. Laronov Institute of Physical and Technical Problems of the North it was decided to introduce these technical reserves in the development of the «Thermometric Glove». These

technical solutions have made it possible to improve the accuracy and reliability of measurements, simplify the design of the product being developed.

A prototype of the thermometric glove was manufactured (Figure 2) having the following basic characteristics:

Measuring range $-50 \dots + 100^{\circ}\text{C}$
Resolution 0.06°C
Measurement error 0.1°C

The sensors are fixed according to the schematic diagram shown in Figure 3a.

The sensors were installed on the fingertips of the human right hand (Figure 3b), then on the fingers of the left hand. The sensor polling period was set to 60 seconds. (Test date - December 2, 2015 from 11:00 to 14:00.) Using the



Figure 1. Ground monitoring systems.



Figure 2. The model of a thermometric glove.

developed prototype, the pilot operation was performed, during which the first results were obtained (Figure 5). The patient of the Republican Hospital No. 2 with cold injuries of the limbs who already received first aid was chosen as a test patient.

Based on the results of the pilot operation, it was decided to develop a «thermometric glove» for 10 fingers with a device for quick fixing of sensors. The number on the fastener corresponds to the number of the sensor that will be displayed by the device. A general overview is shown in Figure 5. Figure 6 presents a view of the sensor in the fastener.

Approbation of the system was carried

out. First, the sensors were fixed to the left hand, which was cooled at -20°C for ~ 5 minutes (Figure 7a).

Then the sensors were fixed to the right hand, which was not cooled (Figure 7b). Figure 8 shows a graph after 15 minutes.

CONCLUSIONS

Developed by the Etalon JSC, device for monitoring the temperature of human limbs is important for diagnosing and establishing the degree of cold injury. Also, this device allows one to evaluate and control the effect of various drugs applied to the patient. In the long term, it is necessary to develop a unified methodology for diagnosing the cold injuries, which will be used universally, based on the modified version of this device.

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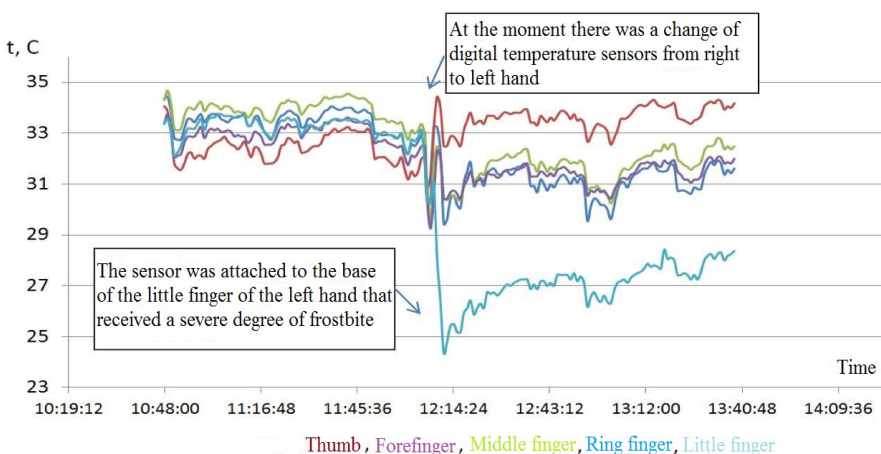


Figure 4. Results of operation.



Figure 5. General overview of the system.



Figure 3. a - the scheme of fixing the sensors on the hands of a person, b - setting the sensor on the patient.

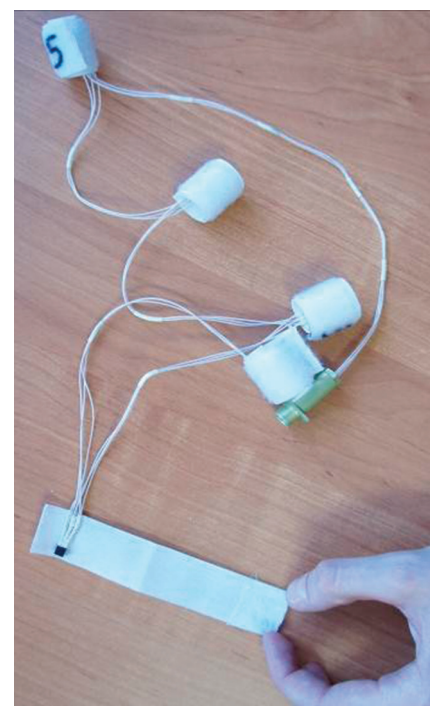


Figure 6. The location of the sensor in the fastener.

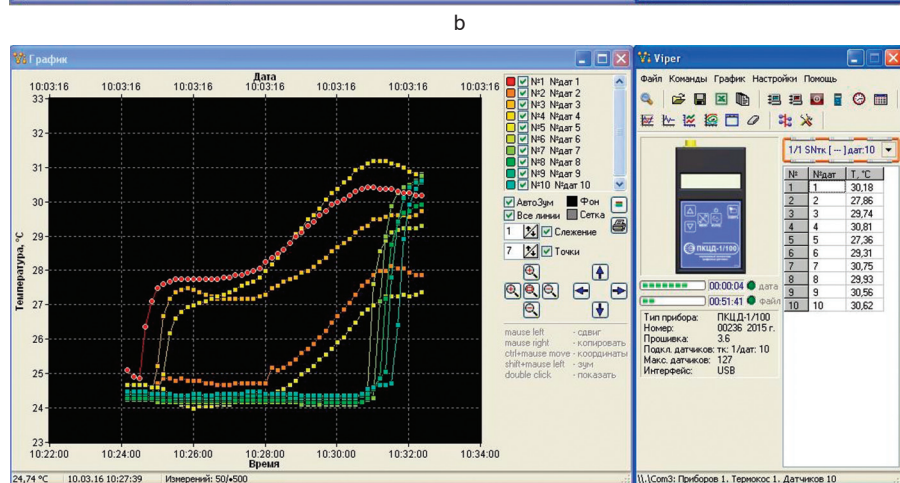
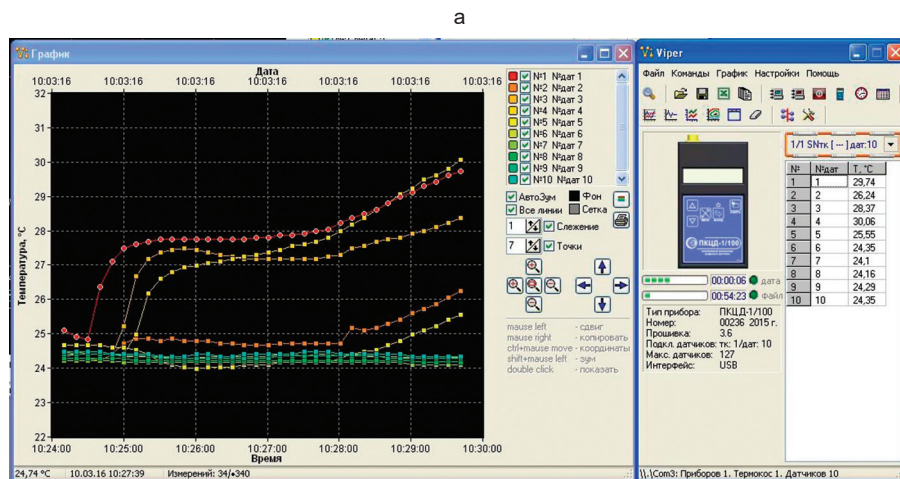


Figure 7. Securing the sensors on the hands: a - on the left hand, b - on the right hand.

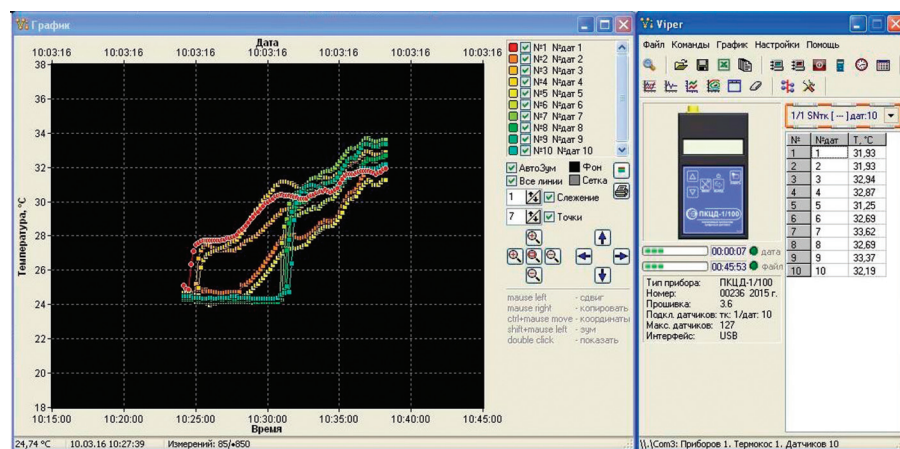


Figure 8. Instrument readings after 15 minutes.

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TREATMENT OF CHRONIC EPSTEIN BARR VIRUS INFECTION IN CHILDREN

ABSTRACT

Article is devoted to an actual problem of modern medicine – Epstein-Barr virus infection (EBV). We examined a group of children aged from 5 to 10 years with low-grade fever of unknown origin and manifestations of oral herpes with a positive ELISA for virus Epstein - Barr (IgG-VCA in high titers, IgG-EBNA, IgG-EA) and positive PCR for EBV.

The children underwent a two-stage treatment: drug inosine pranobex at a dose of 5 mg/kg per day for 10 days, the drug likopid 1 mg 1 time a day for 10 days. All children after treatment for 30 days were re-studied by ELISA and PCR for virus infection Epstein's Barr. It was revealed that in 90% of children were not detected positive IgG-VCA, IgG-EA; positive IgG-EBNA was observed in 20% of children. Positive PCR on EBV were detected in 20% of examined children. In groups of children with EBV there was an increase of reduced levels of CD3+, CD4+, CD16+.

Keywords: immunity, virus, antibody, immunoglobulin, herpes, disease.

Epstein-Barr virus infection (EBVI) is one of the most common human diseases. About 55-60% of young children (under 3 years) are infected with Virus Epstein-Barr; the vast majority of the adult population (90-98%) has antibodies to EBVI.

Chronic active EBV-infection is characterized by long duration and frequent recurrences. Patients' complaints are weakness, fatigue, excessive sweating, prolonged mild fever up to 37,2-37,5°, skin rash, and sometimes joint syndrome, pain in the muscles of the trunk and extremities, heaviness in the right hypochondrium, a feeling of discomfort in the throat, slight cough and stuffy nose, some patients have neurological disorders – causeless headaches, memory impairment, sleep disorders.

The incidence in different countries varies from 3-5 to 45 cases per 100 thousand population is relatively high. EBVI refers to a group of uncontrollable infections for which no specific prevention (vaccination), which certainly affects the level of morbidity [1, 2, 3].

The purpose: to study the characteristics of immunity and the effectiveness of treatment with combination of drugs inosine pranobex and likopid of children with chronic (low-grade fever of unknown origin) Epstein-Barr virus infection.

MATERIALS AND METHODS OF RESEARCH

We examined a group of children (n=10) aged from 5 to 10 years with low-grade fever of unknown origin, and manifestations of oral herpes with a positive ELISA for virus Epstein Barr (IgG-VCA high titers, IgG EBNA, IgG-EA) and positive PCR for EBV (table 1). A group of healthy children (n=20) and a comparison group of children matched

for age was also surveyed.

The children underwent examination of immune status (CD3+, CD4+, CD8+, CD16+, CD22+, IgA, IgG, IgM, IgE) at the National medical center of Republic of Sakha (Yakutia). Comparison of mean values was assessed by univariate dispersion analysis using T-student criterion to assess the equality of average F-Fisher criterion to assess the equality of variance. The relationship between parameters was assessed using the coefficients of the linear and rank correlation.

An important method of diagnosis of EBVI infection is the PCR qualitative detection of DNA virus Epstein-Barr PCR. Material for study is saliva or oral - and naso-pharyngeal mucus, scrapings of the epithelial cells of the urogenital tract, blood, cerebrospinal fluid, prostate secretion, urine. In addition, serological examination methods (ELISA) are performed and clinical manifestations of EBV infection are determined.

RESULTS AND DISCUSSION

All children with chronic EBVI had low-grade fever, headache, recurrence of SARS, sore throats, pharyngitis, increased sweating, fatigue, irritability. In 5 children (50%) labial herpes was observed.

In study group, in 4 (40%) examined children there are noted elevated levels of IgA, IgM, CIK (table 1).

Also there was noted a decrease in the content of CD25+ cells, i.e. activated T cells, increased numbers of natural killer (CD16+), T helper (CD4+), cytotoxic T-lymphocytes (CD8+). In 6 children (60%) showed a decrease in CD 25+ lymphocytes, increased IgM, decreased content of CD4+, CD8+, CD16 (table 1).

Thus, at EBVI there are two types of immune status changes:

a) Enhance its activity (increase in the level of serum immunoglobulins IgA, IgM, increase CEC, increase of CD16+ natural killer enhancing or T-helper cells CD4+, or T-suppressor CD8+),

Table 1

Indicators of immune status in children of Sakha (Yakutia) with the Epstein Barr Virus infection and healthy children

Indicator	Children with infection of the Virus Epstein Barr (n = 4) M ± m	Children with infection of the Virus Epstein Barr (n = 6) M ± m	Healthy children (n = 20) M ± m
CD3+	25,2 ± 1,03	26,1 ± 1,0	27,2±1,04
CD4+	28,9 ± 0,5*	10,1 ± 0,2*	21,3±0,6
CD8+	36,9 ± 0,8*	8,2 ± 0,5*	12,1±2,5
CD16+	22,1 ± 1,2*	6,4 ± 1,4*	11,0±1,01
IRI	0,7 ± 0,6	0,8 ± 0,5	1,08±0,02
IgA	3,6 ± 0,1*	2,4 ± 0,1	2,9±0,6
IgG	18,2 ± 0,7	18,1 ± 0,2	17,1±0,09
IgM	3,2 ± 0,08*	3,8 ± 0,02*	2,2±0,09
CD25+	13,9 ± 1,2*	12,2 ± 1,2*	24,6±0,7
CIK	186,2 ± 1,5<0,05*	85,1 ± 1,5<0,05	70±0,07

Note. In the Tab 1 and 2 *p < 0.05 between norms and obtained indices in each group.

Table 2

Indicators of immune status in children of Sakha (Yakutia) with Epstein Barr virus infection after therapy and healthy children

Indicator	Children with virus infection Epstein Barr (n = 4) M ± m	with virus infection Epstein Barr (n = 6) M ± m	Healthy children (n = 20) M ± m
CD3+	26,2 ± 0,03	27,1 ± 1,1	27,2±1,04
CD4+	23,1 ± 0,15	19,6 ± 0,9	21,3±0,6
CD8+	16,9 ± 0,3	10,2 ± 0,2	12,1±2,5
CD16+	12,1 ± 1,0	10,3 ± 1,0	11,0±1,01
IRI	1,7 ± 0,6	1,9 ± 0,1	1,08±0,02
IgA	2,6 ± 0,4	2,5 ± 0,1	2,9±0,6
IgG	18,1 ± 0,8	18,9 ± 0,2	17,1±0,09
IgM	2,2 ± 0,1	2,4 ± 0,2	2,2±0,09
CD25+	23,4 ± 1,2	22,1 ± 1,2	24,6±0,7
CIK	80,1 ± 1,5	72,1 ± 1,0	70±0,07

b) Immune dysfunction or failure (increase in IgM, a reduction in CD25+ lymphocytes, a decrease in CD16+, CD4+, CD8).

The children underwent a two-stage treatment: drug inosine pranobex at a dose of 5 mg/kg per day in 1 reception for 10 days, the drug Likopid 1 mg 1 time a day for 10 days. All children after treatment for 30 days followed by a re-study of ELISA and PCR for virus infection Epstein Barr. Revealed that 90% of children were detected positive IgG-VCA, IgG-EA, положительный IgG-EBNA were observed in 20% of children. A positive PCR on MBI detected in 20% of examined children. Also observed changes in the immune status of the examined children (table 2). In groups of children with EWBI was an increase of reduced levels of CD3+, CD4+, CD16+.

Thus, in the treatment of a virus infection Epstein Barr in children with drugs inosine pranobex and likopid changes in serological studies (ELISA) and normalization of the immune status are revealed.

CONCLUSIONS

1. At EBVI there are two types of immune status changes:

a) Enhance its activity (increase in the level of serum immunoglobulins IgA, IgM, increase CEC, increase of CD16+ natural killer enhancing or T-helper cells CD4+, or T-suppressor CD8+),

b) Immune dysfunction or failure (povysheniem, reduction of CD25+ lymphocytes, a decrease in CD16+, CD4+, CD8).

2. In the treatment of a virus infection

Epstein Barr in children with drugs inosine pranobex and likopid changes in serological studies (ELISA) and normalization of the immune status are revealed. All the surveyed children had a decrease in CD 25+.

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THE FAR EASTERN PHYTOMINERAL PREPARATION AND THYMODEPRESSINE IN REHABILITATION OF CHILDREN WITH ATOPIC DERMATITIS

ABSTRACT

Social importance of rehabilitation of the children with atopic dermatitis is undoubted. Objective: the efficacy of corneotherapy from far eastern phytomineral preparations and thymodepressine in patients rehabilitation.

Materials and methods. In the remission period 75 (the basic group) patients had baths with torphopeloid extract, emollient with bentonites and thymodepressine nasally. In 21 patients (the comparison group) indifferent ointments were used. Blood serum cytokines, corneometry, tewametry, sebumetry have been investigated.

Results. In basic group not a single case of atopic dermatitis severe exacerbation during a year has been marked. The first relapses is mitigate form have been noted in 9-10 months. The positive dynamics of cytokine pattern and skin functional indices have been preserved. In the comparison group recurrences were noted in 76,1% patients. The studied indices weren't being changed or had the negative tendency.

Conclusion. Corneotherapy with far eastern phytomineral preparation and thymodepressine are effective in rehabilitation of patients with atopic dermatitis.

Keywords: atopic dermatitis, rehabilitation, torphopeloids, bentonites, thymodepressine, cytokines, corneometry, tewametry, sebumetry.

INTRODUCTION

Standardization of medical service parameters is the main way of quality increase and equal chances to get qualified medical aid [8]. Standards have to be mobile enough, based on the latest research achievements and minimize limitations in doctor actions about individual approach to the patient [4]. Respond to high ranks of evident medicine, to be cooperative, i.e. compliant and cause patient's satisfaction by effective doctor's actions [5]. Creation on their basis regional protocols of patient's management taking into account special features of local pathology and possibility of material base are actual and economically substantiated.

Social and medical significance of atopic dermatitis problem is undoubted. Statistic data show that 10-30% of children and 2 – 10% of adult population suffer from this disease with the annual increase of it. The state aggravates the possibility of "atopic march" in 30-60% patients at the age up to 3 years with the involvement of different organs and systems (rhinitis, eyes affect, bronchial asthma). Patients with atopic dermatitis often have diseases of non-allergic nature of gastrointestinal tract, liver and all kinds of infections [2, 3, 14]. Atopic dermatitis renders severe psychological action on patients, his family and everything around him, brings down the life quality. Social and economic burden is significant [6, 16].

The problem of atopic dermatitis has interdisciplinary character, actual

for doctors of different specialties (dermatologists, allergologists, pediatricians, therapists) and workers of social sphere.

According to contemporary idea the fundamentals of atopic dermatitis pathogenesis have the genetically determined disturbances of the skin barrier function, innate and adaptive immunity. Corneocytes and water-lipid mantle ("bricks" and "cement") form barrier function of epidermis. In atopic dermatitis structural disturbances of the stratum corneum is characterized by phospholipid deficit (mainly ceramids), fatty acid (in particular unsaturated ones). The increased transepidermal water loss leads to xerosis and reactive keratosis. Xerosis and keratosis provoke itching and scratching. The throw out of inflammatory mediators is activated and further epidermis damage is potentiated [12, 13]. Deviations Th1/Th2 of immune reactions (biphasic T-cell polarization) and increase of IgE expression have the important meaning.

Changes in cytokine pattern in combination with pleomorphism and polytropism of cytokines also play an essential role in supporting of chronic immune inflammation. The condition of chronic immune inflammation may not have a clear clinical picture that is characteristic for the phase of remission – subclinical immune inflammation. The influence of various triggers (chemical, allergic, infectious), stresses will contribute to relapse of atopic dermatitis [12, 17]. Contemporary corneotherapy by A. Kligman is just directed to the protection

and rehabilitation of the stratum corneum, prevention of the pathologic processes due to its destruction. Corneotherapy principles have got an appreciation in the programmes on the atopic skin care "Aven", "Atoderm", "Lipicar", "A-derma" [1, 7, 9, 10].

In the programmes the important place has organic and nonorganic silicon combinations, taking part in the construction and functioning of the epidermis, connective tissues and membrane structures, promoting skin hydration, having anti-inflammatory similar to steroids action. Plant components with high content of unsaturated fatty acids, triglycerids, phytosterols are used to fulfill skin lipids. However, for all evident merits, the programmes don't enough take into account skin microbiome. Immune corrective measures are not regarded. And these programmes are expensive enough.

Our rehabilitation programme includes Thymodepressine nasally, baths with the Far Eastern torphopeloid extract and emollient on the basis of bentonites and silicone water of the "Kuldur" spring. The composition of torphopeloid extract includes: silicon, humine combinations, lipids, phytosterols, ferments, polyphenols, triterpens providing anti-inflammatory and antiseptic qualities. Free organic acids create hydrotropic effect. Lipids and phytosterols reconstitute skin lipids. Bentonites are natural organic and nonorganic silicone compositions. Thymodepressine is a domestic preparation with marked

immunomodulating action.

MATERIALS AND METHODS

96 patients with atopic dermatitis at the age of 10-16 years in the remission stage have been under control during a year. The diagnosis of atopic dermatitis was made according «Millenium Criteria» for the diagnosis of atopic dermatitis of European Handbook of Dermatological Treatments [11]. Patients have been divided into 2 groups. 75 patients had the suggested corneotherapeutical measures (the basic group). Methodics. Thymodepressine-spray 1 dose (0.25mg) intranasally 1 time in 2 weeks. Total baths with torphopeloid extract (patent RF №240753562 from 20.05.2010) regularly in 2-3 days. Emollient on the basis of the Far Eastern bentonites and silicon water of the «Kuldur» spring have been put daily (patent RF №2230549 from 20.06.2004). 21 patients didn't have such measures (the comparative group). Routine creams (Unna cream) have been used as emollient.

Microbiologic investigations have been done with scrape microscopy and microbiological culture according to the Order Ministry of Healthcare USSR №535 from 22.04/1985 "About unification of microbiological (bacteriological) methods of investigation". The skin barrier function has been studied on the hydration level of the stratum corneum (corneometry), transepidermal water loss (TEWL), the content of the cutaneous sebum secretion (sebumetry) on the apparatus MPA – 5 (Courage – Khazaka electronic GmbH FRG). Cytokines have been determined with hard phase IFA with diagnostic sets "Vector – Best" (Novosibirsk). Clinical evaluation has been added by the index of dermatologic quality life (DIQL). Statistic material processing has been made with the help of Statistica programmes Version 7. There have been calculated middle arhythmic (M) and standard error of middle arhythmic (m). Selection comparison on Student coefficient. Statistical verification in $p < 0,05$.

RESULTS AND DISCUSSION

Complex rehabilitation measures have produced a favourable action on the patients of the basic group. There was not a single case of serious exacerbation during a year. The first relapses have been marked in 9-10 months in 21 (35,7%) out of 75 patients. Relapses were in a mitigent form and rapidly arrested with antihistamine preparations and tacrolimus. In the comparative group relapses were marked in 16 (76,1%) out of 21 patients. The first relapses have been just on the 4-5 month, intensity

of exacerbation in 4 patients have required hospitalization. In the basic group rehabilitation measures have been accompanied by the tendency to normalization of the functional skin parameters. Thus, hydration of stratum corneum has been increased from $29,5 \pm 2,1$ un. up to $36,4 \pm 2,2$ un. (control $42,8 \pm 2,7$ un.). In the comparative group this index was $25,4 \pm 2,3$ un. TEWL in the basic group lowered from $21,1 \pm 1,8$ g/m².hr. to $15,2 \pm 1,4$ g/m².hr. (control $11,7 \pm 1,2$ g/m².hr.). In the comparative group TEWL was $18,9 \pm 1,2$ g/m².hr. Sebumetry index in the basic group has been improved from $86,4 \pm 3,1$ mkg/cm² up to $94,3 \pm 3,2$ mkg/cm² (control $118,4 \pm 4,3$ mkg/cm²). In the comparative group sebumetry index has been a few lowered- $78,5 \pm 4,2$ mkg/cm².

From the starting point *S. aureus* was found in 77,3% ($198,7 \pm 34,6$ CFU/cm²) patients. Resistancy to antibiotics: penicilline, tetracycline, erythromycine, laevomycetine is a typical feature. Polyresistancy is marked in 42% patients. *Candida* spp. are selected in 32,6% patients. By the end of observation in the basic group *S. aureus* is found in 47,5% ($87,5 \pm 13,6$ CFU/cm²) patient. *Candida*

spp. are stated in 17,6% patients of the base group. In the comparative group the studied indices are not practically changed and have inclination to negative tendency.

From the starting points in the phase of remission in patients with atopic dermatitis the level of the studied cytokines in the blood serum has been in the control limits of healthy persons. Rehabilitation measures in the basic group have contributed to maintenance of cytokine content in the limits of normal value. Stability of cytokine pattern testifies to positive tendency of immunology tolerance formation. In patients of the comparative group this tendency has been not practically marked. By the completion of observation there has been stated the increase of concentration of IL-1 β , IL-2, IL-5, IL-6, IL-10, IL-12, IL-17, and TNF α on decreasing IFN γ . It indicates the starting progress biphasic T-cell polarization, characteristic for the patients with atopic dermatitis. However the level of certain cytokines doesn't fully meet paradigm of reciprocal Th1/Th2 relations. Possibly it is associated with genetic polymorphism of cytokines and their pleiotropism, when the functions of

Cytokine content in blood serum in patients with atopic dermatitis in the remission phase

Cytokines	Group of patients Basic n = 75 Comparative n = 21	Cytokines pg/ml		
		Patients		Control group n = 21
		Primary	Secondary	
IL - 1 β	Basic	3,9 \pm 0,4	4,1 \pm 0,3	2,9 \pm 0,5
	Comparative	-/-	5,4 \pm 0,6*	
IL - 2	Basic	19,3 \pm 1,9	20,1 \pm 1,1	17,2 \pm 1,4
	Comparative	-/-	22,4 \pm 2,1*	
IL - 4	Basic	16,2 \pm 1,1	17,1 \pm 1,2	14,1 \pm 1,6
	Comparative	-/-	17,9 \pm 1,4	
IL - 5	Basic	7,1 \pm 0,6*	8,2 \pm 0,5	6,0 \pm 0,5
	Comparative	-/-	9,9 \pm 0,7*	
IL - 6	Basic	4,1 \pm 0,4	4,7 \pm 0,4	2,3 \pm 0,5
	Comparative	-/-	5,3 \pm 0,5*	
IL - 8	Basic	40,6 \pm 2,4	42,1 \pm 2,3	38,4 \pm 2,7
	Comparative	-/-	56,4 \pm 3,8*	
IL - 10	Basic	5,3 \pm 0,5	5,9 \pm 0,4	4,8 \pm 0,4
	Comparative	-/-	7,6 \pm 0,5*	
IL - 11	Basic	13,8 \pm 0,8	14,2 \pm 0,7	12,7 \pm 0,9
	Comparative	-/-	15,1 \pm 0,6	
IL - 12	Basic	4,5 \pm 0,5*	4,9 \pm 0,4	3,6 \pm 0,4
	Comparative	-/-	6,3 \pm 0,6*	
IL - 13	Basic	14,3 \pm 1,1	15,4 \pm 0,9	12,9 \pm 1,2
	Comparative	-/-	16,2 \pm 1,3*	
IL - 17	Basic	7,4 \pm 0,5	8,3 \pm 0,7	6,8 \pm 0,8
	Comparative	-/-	10,9 \pm 0,8*	
IL - 18	Basic	16,7 \pm 1,2	17,4 \pm 1,3	15,9 \pm 1,3
	Comparative	-/-	18,1 \pm 1,1	
FNO α	Basic	10,5 \pm 0,9	11,4 \pm 1,0	9,1 \pm 0,8
	Comparative	-/-	14,8 \pm 1,1*	
IFN γ	Basic	8,7 \pm 0,7*	7,7 \pm 0,5	8,1 \pm 0,2
	Comparative	-/-	5,1 \pm 0,3*	

Note: distinction with control is reliable, $p < 0,05$; control group-healthy children aged 10-16 years.

one (repressed) cytokines fulfill others [12, 14]

The fullness of remission has been evaluated on the questionnaire of the dermatologic index of the life quality (DIQL). The patient's life quality of the basic group, who got rehabilitation measures complex, has been better, than in the comparative one. Medistatistical DIQL in the base group has been $7,4 \pm 0,5$; in the comparative – $15,3 \pm 0,8$. The starting index was $27,2 \pm 0,9$.

CONCLUSION

Thus, the obtained results testify the effectiveness of rehabilitation measures with the use of corneotherapy as baths and emolient from the Far Eastern phytomineral materials and Thymodepressine intranasally in patient with atopic dermatitis in the remission period. The method widens the control zone for the minimal persistent immune inflammation, prevents the skin inflammatory modulating and contributes to the tendency of immunologic tolerance forming. The reserves of ecologically clean phytomineral materials in the Far Eastern Federal Region great. Farmacoeconomic effect is evident and essential.

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ORGANIZATION OF HEALTHCARE, MEDICAL SCIENCE AND EDUCATION

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PHYSICIAN RESOURCE COVERAGE OF CHILDREN AND ADOLESCENTS IN THE RS (YA)

ABSTRACT

The article presents the analysis of the implementation of Priority national project «Health» in terms of training and retraining of medical personnel, upgrading the skills of pediatricians. Data on the physician resource coverage for 2000 and 2015 are given.

Keywords: pediatricians, neonatologists, physician resource coverage, Yakutia, children's population.

INTRODUCTION

Priority national projects (PNP), proclaimed by the President of Russia V. V. Putin in 2005, organically intertwined into the existing social policy and create a solid framework for the implementation of the key state task of modernizing education, culture, health and science, and providing comfortable living conditions for the population.

14.10.2005 the expanded board of the Ministry of Health and Social Development of the Russian Federation «On the tasks for the implementation of the priority national project in the field of public health» was held. The goal of the PNP «Health» is defined as the improvement of the health status, the quality of life of people and the social well-being of society. PNP «Health» is aimed at increasing the accessibility, quality and effectiveness of medical care to the population, strengthening the material and technical base of primary health care and improving staffing.

The following tasks were set:

- Development of primary health care:
 - cash payments to general (family) doctors, district therapists, district pediatricians and nurses of general practitioners, district therapists, district pediatricians, taking into account the volume and quality of medical care provided;
 - training and retraining of general practitioners (family practice), district

therapists and pediatricians;

- equipping with diagnostic equipment outpatient clinics;
- vehicles with emergency medical care, including re-mobilizers.

• Preventive actions:

- carrying out of immunization of the population within the framework of the National calendar of vaccinations;
- detection and treatment of human immunodeficiency virus, hepatitis B and C infected with the virus;
- examination of newborn children;
- examination of the working population.

• Providing the population with high-tech medical care:

- increase in the volume of rendering high-tech assistance 4 times by 2008;
- the construction of centers for the replication of high medical technologies;

Implementation of the activities of the PNP «Health» since 2006 has begun to improve the quality of health services, the availability of medical care to the population, increase the salaries of medical workers, strengthen the material and technical base of health care facilities, upgrade the skills of health workers, expand the list of preventive measures, monitor health working population.

Implementation of the PNP «Health» in terms of training and retraining of medical personnel, raising the level of qualification of district pediatricians was implemented on the basis of the Far

Eastern State Medical University (FEFU), the Medical Institute of North Eastern Federal University (MINEFU). Within the framework of the project were trained:

2006 - 105 district pediatricians on the basis of FEFU, 60 on the basis of MINEFU, 44 neonatologists;

2007 - 67 district pediatricians on the basis of FEFU, 34 on the basis of MINEFU, 43 neonatologists;

2008 - 63 district pediatricians on the basis of FEFU;

2009 - 21 district pediatrician on the basis of FEFU, 39 neonatologists, 18 endocrinologists.

MATERIALS AND METHODS

The analysis of the implementation of the Priority Project «Health» in terms of training and retraining of medical personnel, raising the level of qualification of district pediatricians. The analysis of the availability of pediatric medical personnel for the children's population for 2000-2015 was carried out.

RESULTS

The quality of medical care for the children of the population largely depends on the staffing of pediatric staff. Availability of pediatricians in 2015. amounted to 16.5 per 10,000 children's population (RF-16.7), while in 2000, - 13.8. The availability of neonatologists by doctors in the Republic is 27.7 per 10000 population (RF-30.5) (2000-35.4). The provision of district pediatricians was 10.0 per 10000 population (2000-5.1, at

Table 1

The physician resource coverage of the children's population in the territory of the Republic of Sakha (Yakutia) (per 10 000 population of the corresponding age)

	2000	2005	2010	2011	2012	2013	2014	2015	РФ, 2015
Pediatric profile (per 10000 children's population) (according to F-17)	15,3	18,0	22,2	22,1	20,9	20,2	19,1	18,2	
Pediatricians (per 10000 children's population) (according to F-17)	13,8	16,1	19,9	19,8	18,6	17,9	17,2	16,5	16,7
By district pediatricians (per 10000 children's population) (according to f-30)	5,1	8,6	10,7	10,1	9,4	9,3	10,2	10,0	
Neonatologists (for 10,000 children under the age of 1 year) (according to F-17)	35,4	36,4	38,6	37,9	37,7	38,4	28,4	27,7	30,5

Table 2

Physical persons of doctors on the territory of the Republic of Sakha (Yakutia)

	2000	2005	2010	2011	2012	2013	2014	2015
Pediatric profile (according to-17)	463	499	557	555	531	516	493	476
Pediatricians (according to f. 17)	417	446	498	497	472	458	445	431
including district pediatricians (according to f. -30)	153	239	268	254	240	238	263	261
Neonatologists (according to-17)	46	53	59	58	59	58	48	45

the beginning of the PNP «Health 2005-8.6) (Table 1).

As shown in table 2 in the Republic of Sakha (Yakutia) in the pediatric service there is a positive dynamics in terms of the number of individuals working in the system, for example, pediatric specialists in 2015 -476 (2000-463), pediatricians -431 (2000-417), district pediatricians - 261 (2000 - 153), neonatologists - 45 (2000 - 46).

During the implementation of the PNP «Health», the level of certified and certified pediatricians increased (Table 3). The certificate of a specialist is 94.9% of pediatricians, the certificate of a

neonatologist is 96.8% of doctors.

CONCLUSION

The quality of medical care, its accessibility and security is directly related to the provision of medical personnel. Undoubtedly, the fact that the implementation of federal programs increased the number of doctors of pediatricians and neonatologists in the healthcare system of the region, and also formed the basis for improving their qualifications.

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Table 3

Specific weight of certified pediatric physicians on the territory of the Republic of Sakha (Yakutia)

		2000	2005	2010	2015
pediatricians	Category	52,0	49,8	51,8	55,9
	Certificate	54,4	82,3	97,6	98,8
neonatologists	Category	37,0	60,4	71,2	68,9
	Certificate	47,8	84,9	100,0	100,0

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EFFICIENCY OF CARRYING OUT PROFILACTIC MEDICAL EXAMINATIONS OF CHILDREN AND ADOLESCENTS IN THE REPUBLIC OF SAKHA (YAKUTIA) BY THE DATA OF OFFICIAL MEDICAL STATISTICS

ANNOTATION

The article analyzes the official medical statistics of these preventive medical examinations of the children of the Republic of Sakha (Yakutia) and the Russian Federation for 2011-2015. The evaluation of the effectiveness of conducting preventive medical examinations in a comparative aspect is given.

Keywords: children, preventive examinations, Yakutia.

INTRODUCTION

The first decade of the beginning of the 21st century was marked by the presence of two trends developing in the RF healthcare system: an increase in the volume of medical services rendered to the population and a revival of the system of medical examination. The effectiveness of conducting preventive medical examinations in the traditional way is 7-11%. In this regard, the role of the use of automated technologies for preventive examinations of the population

is increasing [2].

Evaluating the quality and efficiency of visiting and practical work of district medical specialists in RS (Y), it is possible to note the following: The central district hospitals try to execute their planned departures in a short time, at the same time brigade method, because of economic, transport and personnel problems. In this regard, more than 80% of the managers of the paramedic midwife remain dissatisfied with the results of these visits [1].

The organization of mass preventive examinations in Yakutsk is also carried out with a heavy workload, both for medical staff and patients. Today, experts widely use the statistical information received during mass dispensary / preventive examinations, but very few people talk about how much and how reliable the data of these works are.

Materials and methods

The article presents an analysis of the official medical statistics of these preventive medical examinations of

the children of the Republic of Sakha (Yakutia) and the Russian Federation for 2011-2015. We have analyzed the report form of the Federal State Statistical Survey No. 31 «Information on medical care for children and adolescents-schoolchildren.» The report form No. 31 contains the number of children who, during preventive examinations, have a decrease in hearing acuity, decreased visual acuity, speech defect, scoliosis, and posture disorder.

RESULTS

The coverage of preventive examinations of children and adolescents in the RS (Y) is more than 90%.

According to the analysis, the decrease in hearing acuity in children of the RS (Y) in the range of 2.1-2.5‰, in the Russian Federation 1.7-2.0‰. With age, the prevalence of hearing impairment increases. Before the end of the school in 16-17 years, this pathology meets 3.9-5.7 per 1000 people examined, in the Russian Federation it is 3.0-3.3 cases per 1000. There is an increase in the frequency of hearing impairment before the end of school more than 1.5 times (Table 1).

Reduction of visual acuity is a common violation of health among schoolchildren and occupies one of the leading ranking places in the structure of morbidity. The frequency of occurrence of this disorder in children of the Republic of Sakha (Yakutia) (RS (Y)) varies from 53.3 to 63.3‰, in the Russian Federation from 70.0 to 74.3‰; before the end of school in 16-17 years this pathology was revealed in 127,4-149,6 cases out of 1000 examined, in the Russian Federation 151,6 - 153,2. In the whole process of school education, the prevalence of visual impairment increases 2.5 times. The level of detectability of this pathology in the Russian Federation is higher than in the Republic of Sakha (Yakutia). (Table 2).

A speech defect is a common violation among children attending pre-school institutions and students of the first classes of mass schools. The frequency of occurrence of this violation in the Republic of Sakha (Yakutia) in the range from 15.1-17.3‰, in the RF 31.2-34.2‰. Compared with RF in the RS (Y), two times less. The frequency of occurrence of this disorder among preschool and primary school children in the RS (Y) in the range of 44.1-53.4‰, in the RF 77.1-91.7‰. In this age period in the RS (Y) is 2 times lower. Among students in the middle and upper grades, speech defects are rare. Before the end of the school at the age of 16-17 this pathology

Contingents		Revealed during examination with a decrease in acuity of hearing				
		2011	2012	2013	2014	2015
TOTAL CHILDREN UNDER THE AGE OF 14 AND TEENAGE SCHOOLCHILDREN AGED 15-17 YEARS	RS (Y)	2,5	2,2	1,9	2,1	1,7
	RF	2,0	2,0	1,8	1,7	
From the total: before entering a preschool institution	RS (Y)	1,2	1,5	1,5	2,3	1,0
	RF	1,6	1,7	1,6	1,4	
Before entering school	RS (Y)	2,2	2,0	1,9	1,7	2,4
	RF	2,4	2,3	2,2	2,1	
When moving to subject learning (grades 4-5)	RS (Y)	2,8	2,7	2,9	2,4	1,8
	RF	2,8	2,7	2,5	2,3	
Before graduation from school (16-17 years)	RS (Y)	5,7	4,3	3,3	3,9	3,4
	RF	3,3	3,2	3,0	3,0	

Contingents		Revealed during examination with a decrease in visual acuity				
		2011	2012	2013	2014	2015
TOTAL CHILDREN UNDER THE AGE OF 14 AND TEENAGE SCHOOLCHILDREN AGED 15-17 YEARS	RS (Y)	63,4	58,8	53,7	53,3	47,5
	RF	74,3	74,4	70,7	70,0	
From the total: before entering a preschool institution	RS (Y)	10,9	10,5	11,0	32,9	14,9
	RF	26,8	26,3	27,6	26,3	
Before entering school	RS (Y)	53,6	48,4	50,6	47,4	47,6
	RF	56,9	56,0	54,3	54,7	
When moving to subject learning (grades 4-5)	RS (Y)	112,1	92,7	102,4	96,2	74,8
	RF	120,9	117,9	110,5	109,8	
Before graduation from school (16-17 years)	RS (Y)	149,6	147,1	136,0	127,4	146,8
	RF	153,2	153,4	156,0	151,6	

Contingents		Identified in examinations with speech defects				
		2011	2012	2013	2014	2015
TOTAL CHILDREN UNDER THE AGE OF 14 AND TEENAGE SCHOOLCHILDREN AGED 15-17 YEARS	RS (Y)	17,3	16,8	14,8	15,1	12,9
	RF	34,2	35,3	32,6	31,2	
From the total: before entering a preschool institution	RS (Y)	35,3	37,1	36,6	46,1	48,8
	RF	87,1	85,4	81,5	79,2	
Before entering school	RS (Y)	53,4	49,4	43,3	44,1	39,4
	RF	91,7	86,0	82,9	77,1	
When moving to subject learning (grades 4-5)	RS (Y)	6,6	7,2	7,7	7,0	6,3
	RF	12,8	11,5	11,1	10,2	
Before graduation from school (16-17 years)	RS (Y)	4,9	4,1	3,2	2,7	2,6
	RF	4,1	3,7	3,5	3,7	

is less common (RS (Y) 2.7-4.9‰, in the RF 3.7-4.1‰). In the process of school education, the prevalence of speech deficit among students decreases in 11,3 times (Table 3).

Posture disorders are common health problems among students in mass schools and occur 3-6 times more

often than scoliosis. The frequency of occurrence of this violation in the RS (Y) is in the range from 15.1-17.3‰ (in the RF 31.2-34.2‰) and twice less than in the RF. The prevalence of these functional disorders in children before entering school is 25.4-34.2‰ (RF 63.2-77.8‰). At the age of 15 years in the RS

Table 4

The results of preventive examinations with impaired sediment in children and adolescent schoolchildren (by age groups) per 1000 examined

Contingents		Revealed during examination with a violation of posture				
		2011	2012	2013	2014	2015
TOTAL CHILDREN UNDER THE AGE OF 14 AND TEEN-AGE SCHOOLCHILDREN AGED 15-17 YEARS	RS (Y)	26,9	24,4	22,5	22,3	19,1
	RF	76,0	72,5	69,8	65,3	
From the total: before entering a preschool institution	RS (Y)	5,0	6,7	6,4	13,0	5,3
	RF	18,8	17,7	17,5	14,1	
Before entering school	RS (Y)	34,2	32,8	25,2	25,4	22,8
	RF	77,8	74,6	69,1	63,2	
When moving to subject learning (grades 4-5)	RS (Y)	49,8	40,0	33,2	33,3	28,1
	RF	124,3	115,0	106,8	98,2	
Before graduation from school (16-17 years)	RS (Y)	50,7	46,4	53,0	43,6	48,7
	RF	115,0	112,1	114,5	107,7	

Table 5

The results of preventive examinations with scoliosis in children and teenage schoolchildren (by age groups) per 1000 examined

Contingents		Revealed during examinations with scoliosis				
		2011	2012	2013	2014	2015
TOTAL CHILDREN UNDER THE AGE OF 14 AND TEENAGE SCHOOLCHILDREN AGED 15-17 YEARS	RS (Y)	12,7	11,3	8,9	8,3	6,6
	RF	20,0	19,7	18,1	16,8	
From the total: before entering a preschool institution	RS (Y)	0,7	0,8	1,2	2,2	1,0
	RF	1,8	1,8	1,9	1,6	
Before entering school	RS (Y)	6,5	7,6	5,0	2,7	3,8
	RF	9,8	9,2	8,1	8,2	
When moving to subject learning (grades 4-5)	RS (Y)	18,1	16,3	12,6	11,3	9,6
	RF	29,4	27,4	25,0	23,1	
Before graduation from school (16-17 years)	RS (Y)	41,6	37,7	35,7	31,0	25,0
	RF	58,0	55,8	55,0	50,0	

(Y) 43.6-50.7 ‰ (RF 129.4-144.1 ‰). Before the end of school in 16-17 years in the range of 22.3-26.9 ‰ and 3 times less than in the RF (RF 65.3-76.0 ‰) (Table 4).

Frequency of occurrence of scoliosis according to the data of preventive examinations in the RS (Y) in the range from 8.3-12.7 ‰ (RF 16.8-20.0 ‰). Compared with Russia, twice less. The frequency of detection of this pathology before admission to school varies between 2.7-6.5 ‰, (RF 14.6-17.2 ‰). Before the end of the school in the 16-17 years in the range of 2.7-4.9 ‰ (RF 3.7-4.1 ‰) (Table 5).

Thus, the comparative analysis of the results of mass preventive examinations in the Republic of Sakha (Yakutia) and

the Russian Federation showed that the prevalence of speech defects, posture disorders and scoliosis for the period from 2011-2014 is significantly lower in the RS (Y) than in the whole of the RF.

The indicator of the provision of the population of the Republic of Sakha (Yakutia) by doctors, average medical workers is not lower than in the Russian Federation as a whole. However, the obtained results of the analysis of official medical statistics on the prevalence of pathology in the course of mass preventive medical examinations once again confirm the fact of low detectability due to low availability of narrow specialists. According to official data, only 9 districts are provided with orthopedic doctors from 34 districts of the country,

4 districts do not have ophthalmologists, and there are no speech therapists in almost all districts.

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S.P. Vinokurova, O.G. Afanasyeva

COMPREHENSIVE ESTIMATION OF HEALTH STATUS OF M.K. AMMOSEV NEFU STUDENTS

ABSTRACT

The paper presents the results of a comprehensive study of the health status of the NEFU students for 2013-2014. Analysis of the results of students' health study from the uluses (districts) of the Sakha Republic (Yakutia) testifies that students' health is weakened even before entering the university. The survey showed that the majority of students are unhealthy, with low rates of physical ability, indicative of weak physical fitness.

The **purpose** of the research: a comprehensive study of the health status of students of the NEFU for the 2013-2014.

We analyzed the data of a medical examination of 755 1st-year students of the Medical Institute (MI), the institutes of foreign philology and regional studies (IZFIR) and the Engineering and Technical Institute (ITI) of the NEFU. 482 (63.84%) are girls and 273 (36.16%) are boys. The age range of the subjects was 15-20 years. The study was conducted on a complex program, which included several stages.

The analysis of the results of the study of health of student youth from the Republic Sakha (Yakutia) uluses (districts) testifies that the health of students is weakened even before entering the university. The conducted examination of the health indicators of students of the 1st course of the NEFU showed that most of them are unhealthy, with low indicators of physical working ability, indicative of poor physical fitness, and they need preventive measures for forming and strengthening their health.

Keywords: comprehensive assessment, state of health, students, higher professional educational institution.

INTRODUCTION

Students represent a special social group, characterized by a specially organized, spatially and temporarily structured existence, working, living and leisure conditions, social behavior and psychology and a system of value orientations. The current tempo and level of educational and psychological loads are much higher than the adaptive capacity of the main masses of students, which finds its natural reflection in the processes of studying in universities and acquiring professional skills [6]. The student's health problem is topical, especially in connection with a new understanding of the role of universities in the training of a competent specialist for social production.

In program documents, adopted by state bodies, in particular, the «Concept of the demographic development of the Russian Federation until 2015» and in the «National Doctrine of Education of the Russian Federation», solving the problems of improving health state of the student youth of higher education has a key role. According to domestic and foreign researchers, a close relationship between health and cognitive activity has been revealed: the higher the level of individual health, the more effective is the learning ability [2, 3]. The student's health status directly influences successful professional activity and lifestyle in general and thus acquires a highly public significance [5]. It is noted that at considering the future professional activity of a student, it is necessary to take into consideration the necessary physical and functional reserves for effective implementation, an effective

level of physical working capacity and psychophysical readiness that are most suitable not only for professional but also for creative opportunities.

Annual analysis of the results of medical examination of students of M.K. Ammosov North-Eastern Federal University gives evidence that a number of students, having health problems, not decreases but tends to increase [1]. Of particular anxiety and concern is the fact that the majority of freshmen, graduates of secondary general education schools of the RS (Y), have pathologies of the organs of vision, the musculoskeletal system, the nervous, cardiovascular and respiratory systems. In addition, a large number of students, having several chronic diseases, is noted. This leads to a steady increase in the proportion of people assigned to a special medical group (SMG) in physical education classes. In 2012-2013 the number of students directed to the SMG in Russian universities was about 35-40%. Up to 30-60% of them have limitations associated with diseases of the cardiovascular system [7].

According to O.G. Rumba [6] the number of students who, for health reasons, are not allowed to exercise at all, has dramatically increased. Therefore, in recent years, the issues of the health status of student youth, its preservation in the context of improving the effectiveness of the educational process in the university, are of great interest.

The purpose of the research: a comprehensive study of the health status of students of the NEFU for the 2013-2014 academic year.

MATERIALS AND METHODS OF RESEARCH

We analyzed the data of a medical examination of 755 1st-year students of the Medical Institute (MI), the institutes of foreign philology and regional studies (IZFIR) and the Engineering and Technical Institute (ITI) of the NEFU. 482 (63.84%) are girls and 273 (36.16%) are boys. The age range of the subjects was 15-20 yrs. The study was conducted on a complex program, which included several stages. At the first stage of the work, a questioning and analysis of the student's objective status (complaints, anamnesis of life and disease, a sports history, a state of health) were conducted. The second stage of the study was the examination of physical development: somatometric - height at standing, height at sitting, body mass, circumference and chest excursion, physiometric - hand and stature dynamometry, assessment of the state of the reserves of the respiratory system (VCL, Stange, Genci tests), physical working capacity (Ruffier test). At the next stage of the comprehensive study, we analyzed the incidence of students of different faculties, according to the medical examination data at the State Clinical Hospital of the Republic Sakha (Yakutia) «Polyclinic No. 5».

RESULTS AND DISCUSSION

The state of health of students is a dynamic process that constantly changes under the influence of external and internal factors, the combined effect of which can lead to both its deterioration and improvement. The formation of the health of student youth in the learning process is affected by many factors that can be conditionally divided into two

groups. The first group is the organization of the learning process (the length of the school day, the training load due to the schedule, breaks between classes, the state of the classrooms, etc.). The second group of factors is subjective, personal characteristics (diet, motor activity, organization of leisure, presence or absence of bad habits, etc.). In the real conditions of learning and life, it is the second group of factors that characterizes the lifestyle of students that has a greater impact on health [4, 5].

Testing «Assessment of my condition» (test by V.A. Doskin et al.) of NEFU students showed that the majority of university students consider themselves healthy: 74% in 2013, 81% in 2014. Evaluation of their own health by young people shows, that in most cases, they rather do not think about their health than they really are healthy. This point is confirmed by the fact that almost half of the students admit that they do not have any information about their health.

According to the questionnaire, 27% of students try to adhere to the diet, while 74% believe that rational nutrition is an integral part of a healthy lifestyle. An important factor in forming the health of students is the organization of nutrition, the nature of which depends on the students themselves and is a reflection of their social attitudes. According to the results of our study, the majority of students 73% (551 people) had diet disorders: absence of breakfast - 264 students (47%), full dinner - 165 (29), dinner - 44 (7.9), one meal per day - 78 (14%). In addition, students rarely had hot dishes, including first courses, a monotonous menu, eating food «on the move», the use of fast food. Among the reasons for the violation of the diet, students note a short break between classes, a shortage of seats and a queue in student canteens, a saving mode due to a lack of scholarships.

Only 21% of students adhere to the sleep regime. The students note the large training loads, as well as inability to plan their time to be the main reasons for the violation of sleep regime.

Studying the incidence of students showed that the first place in the structure of morbidity is occupied by disorders of the musculoskeletal system - 37.4%, then - diseases of the gastrointestinal tract (32.7%), cardiovascular system (15.1%), respiratory system diseases (14, 8%). Recently there has been a steady trend towards an increase in the number of students with functional disorders of the musculoskeletal system. In addition,

The main indicators of the physical health of students

Indicator	Boys (n=482) (M±m)	Girls (n=273) (M±m)
Height (cm)	171,12±1,11	159,51±0,77
Body weight (kg)	63,41±1,23	53,66±0,54
Circumference of the chest on inspiration (cm)	91,24±1,59	84,58±0,81
Circumference of the chest on exhalation (cm)	86,11±1,04	80,30±0,84
VCL	3523,0±104,57	2483,08±62,29
Dynamometry of the right hand (kg)	39,09±1,02	23,79±0,58
Dynamometry of the left hand (kg)	36,29±0,93	20,65±0,51
Static force (kg)	126,15±2,97	53,21±0,82
Heart Rate	74,96±1,55	76,37±1,26
AHS (mmHg)	118,05±2,03	105,59±1,51
AHD (mmHg)	74,67±1,42	67,43±1,14
The Stange test (sec)	44,22±3,38	37,26±1,93
Genci test (sec)	24,96±1,25	21,48±1,06

tracing the dynamics of morbidity, it is necessary to note the increase in the number of students, having more than four diseases in anamnesis.

Most of the surveyed students do not have a clear motivation for a healthy lifestyle. As a result of the questionnaire it was found out that 50% of students sporadically consumed alcoholic beverages, 21.9% - smoked 7-10 cigarettes a day. The main indicators of physical health of the NEFU 1st year students are presented in the table.

Analysis of the results of assessing the overall physical ability in a group of girls testifies that the largest number of girls (53.02%) has «satisfactory» indicators of physical ability, 34.23% - «poor», 9.23% - «mediocre» and only 3.36% of girls have «good» ability. In the group of boys the following results were obtained: 52.45% of the students are characterized by «satisfactory» physical working capacity, 25.17% - «mediocre», 17.48% - «bad» and 4.9% have «good» ability.

At a comparative analysis of the incidence of students, depending on the educational profile according to the medical examination data it was revealed: in all research faculties, the greatest proportion have eye diseases (35.81%); second place among the students of MI is occupied by diseases of the nervous system (15.34%), IZFiR and ITI - the musculoskeletal system (21.97 and 19.07%); on the III place among students - the musculoskeletal system diseases (10,16%), IZFiR - cardiovascular system (15.15%) and ITI - diseases of the nervous system (11.63%).

It should be noted that 27.27% of students among MI students, ITI - 13.65%, IZFiR - 12.0% were regarded as healthy.

The next stage of our research was a distribution of the students into health groups: 42.1% of the students (healthy and practically healthy) are referred

to health group I; 41.24 (students with functional deviations) - II; 14.62% (students who have chronic pathologies) - III.

The increase in the number of students to the senior courses, assigned to the third group of health, who need treatment, is mainly due to the somatic diseases on the background of educational process intensification, increasing tempo of life, the irrational mode of work and rest, informational, psycho-emotional overloads in the process of educational activity, lack of basic information about their physical condition and the capabilities of the body. In addition, under the conditions of the university, the impact of hypodynamia and hypokinesia on the health of student youth is exacerbated.

Analysis of the results of the study indicates an increase in the number of students who have deviations in health status and are therefore assigned to the III health group. It should be noted that deviations in the state of health of students, as a rule, are acquired even in early childhood.

The analysis of the morbidity of the students of the III health group, depending on the place of residence, revealed that in its structure a significant proportion falls on the graduates of schools in Yakutsk - 146 students (31.8%), then the Suntar ulus - 33 (7.20%) and 25 students (5.45% each) from Verkhnevilyuysky and Megino-Kangalassky uluses.

It should be noted that among the freshmen from Anabarsky (7 prs.), Verkhnekolymskiy (9), Lenskiy (24), Ust-Maysky (18) and Even-Bytantaik (4 prs.), there are no students assigned to the III health group.

Specific medical groups for physical training are defined: in the main group there are 502 students, which is 66.49%, in the special medical group - 138

(18.28%) and in the medical physical training group (SMG-2) - 115 (15.23%).

CONCLUSIONS

Thus, the analysis of the results of the study of health of student youth from the Republic Sakha (Yakutia) uluses (districts) testifies, that the health of students is weakened even before entering the university. The conducted examination of the health indicators of the NEFU 1st course students showed that most of them are unhealthy, with low indicators of physical working ability, indicative of poor physical fitness, and they need preventive measures for forming and strengthening their health.

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HYGIENE, SANITATION, EPIDEMIOLOGY AND MEDICAL ECOLOGY

T.I. Nelunova, T.E. Burtseva, V.G. Chasnyk, S.A. Evseeva EPIDEMIOLOGY OF CONGENITAL HEART DISEASES IN CHILDREN

ABSTRACT

The article presents data from registers of congenital heart defects in foreign countries and regions of the Russian Federation. Overall, according to the literature there are significant variations of prevalence and primary morbidity of congenital heart disease, probably due to good monitoring based on a network registers with the use of modern diagnostic possibilities in more developed countries.

Keywords: congenital heart disease, children, registers.

INTRODUCTION

Congenital heart disease (CHD) is a heterogeneous group of diseases, including isolated, combined and combined anomalies of multifactorial etiology. The urgency of the problem of the developmental defects of the circulatory system is due to high mortality rates, especially during the first year of life, and disability. More than 90 species of isolated and associated (CHD) are known. Without a radical correction, 50-60% of children die in the first year of life. The mortality of children with circulatory defects is highest in the neonatal period [19].

To study the etiology, develop preventive measures and plan the organization of medical care for children with malformations, accurate data on prevalence of the (CHD) are needed. The organization of their monitoring is carried out on the basis of the analysis of

epidemiological data taking into account the dynamics in different age periods. The main tool for such monitoring is the specially created registers [6]. In addition to registering new cases of (CHD), such databases can serve as a basis for identifying new possible teratogenic factors and other causes contributing to the formation of mutational processes at both individual and population levels [4, 7]. In addition, registers containing information about families with hereditary-conditioned pathology, provide us with an opportunity to study the mechanisms of development of genetic prerequisites for the formation of malformations [10].

1. Prevalence and structure of congenital heart diseases in Europe, Asia and America

Congenital malformations of the cardiovascular system, according to world statistics, occur at a frequency of 8.0-10.2 per 1000 newborns, among the

live-born children this figure is 6-8 cases per 1000 children [3, 2, 29]. In England, it is at the level of 8.2 per 1000 newborns, in the USA - from 1.5 to 6.3 per 1,000 newborns [26].

In a systematic review on the analysis of the incidence of congenital heart defects and the circulatory system in the world for the period from 1955 to 2012, (11 studies), it was shown that severe CHD occurred at a frequency of 0.414-2.3 per 1000 live births, moderate-grade malformations were 0.43-2.6 per 1000 newborns, and malformations with minimal changes were 0.99 -10.3 per 1,000 children [32]. At the same time, there were no statistically significant differences in the incidence of heart disease, depending on their severity.

According to Hoffman J.I. (2004), the total number of newborns with newly diagnosed CHD in the world in 2000 was about 623,000 children, of whom

approximately 320,000 had isolated congenital anomalies, and the remaining children had combined and associated defects [26]. At the same time, a combination of heart defects with other congenital developmental anomalies is observed in approximately 35-40% of cases [21], and on the contrary, about one third of children with chromosomal abnormalities (most often represented by aneuploidy or a change in the number of chromosomes) suffer from congenital heart disease [33].

According to French researchers who analyzed the frequency of occurrence of CHD in Paris on the basis of the Register of congenital anomalies, in 2005-2008, the total prevalence of these vices was 9.0 per 1,000 children, of which 40% of the isolated defects were diagnosed prenatally [28, 27].

An epidemiological study based on the CHD database in Quebec, Canada, from 1983 to 2010, containing information on 107559 patients with congenital heart anomalies, showed that the average prevalence of this pathology among children in the first year of life was 8.21 per 1000 children, in 2010 it reached 13.11 per 1000 children and 6.12 per 1000 adults. From 2000 to 2010 there was an increase in the prevalence of CHD by 11% in children and 57% in adults. At the same time, the prevalence of severe heart disease increased by 19% among children and by 55% among adults [31].

In 2010, the US had about 2.4 million patients with congenital heart disease, of which 1.4 million were adults and 1 million were children. These data draw the attention of researchers and the medical community to the need to actively identify and provide medical care to patients with CHD not only in children, but also in all age groups [24].

In Europe, a network of EUROCAT registries was established in 1979, based on a population approach, covering about 1.5 million births in 20 countries in Europe, with the aim of monitoring the congenital anomalies epidemiology and standardizing the data obtained [23]. According to this follow-up, hemodynamically significant congenital malformations in European countries were recorded at a frequency of 23.8 per 1000 births, of which 80% of children were born alive, 2.51% of children were born with congenital anomalies incompatible with life, 2.1% of cases, stillbirth was observed, in 17.5% of cases, abortion was carried out due to prenatal diagnosis of congenital malformations [22].

According to the EUROCAT statistical monitoring report published in 2009,

congenital heart diseases are among the most common congenital anomalies in Europe, ranked third in the structure of all developmental anomalies, with a downward trend over the last decade. Thus, the prevalence rates of CHD from 2000 to 2009 decreased by 14% (from 19.49 to 16.71 per 10,000 newborns). Particularly pronounced was a decrease in the prevalence of such vices, such as an interventricular septal defect and pulmonary artery stenosis. Such positive trends were associated with the effective preventive use of folic acid by pregnant women. Also, the positive effect of such monitoring could be explained by the improvement of management of such risk factors as chronic diseases of mothers, primarily diabetes mellitus, and also reduction of behavioral risk factors (for example, smoking) [23].

According to official statistics of the Ministry of Health of the Republic of Kazakhstan, for the period from 2003 to 2013, in the country there was a significant increase in the prevalence of CHD from 4.4 to 8.9 per 1000 newborns, respectively, while their share among all developmental anomalies increased from 13.1 to 28.3%. The same trend was observed in the analysis of the prevalence of CHD among children under five: in 2003 this indicator was 2.7 per 1,000 children, and in 2012 - 6.3 per 1000 children, which amounted to 21.4% and 32.2% from all developmental defects, respectively. Defects of the interventricular septum (39.6%), defects of the interatrial septum (15.1%), an open arterial duct (14.3%) and pulmonary artery stenosis (4.4%) prevailed in the structure of the CHD.

Among children with combined defects, in 6.2% of cases, tetrad of Fallot was diagnosed, in 1.31% - double retreat of the main vessels, 2.21% - transposition of the main vessels (TMS), in 1.99% - hypoplastic syndrome of the left divisions and in 2.2% - a syndrome of hypoplasia of the right ventricle [18, 13].

A meta-analysis of studies on the prevalence and structure of congenital heart disease in Nigeria from 1964 to 2015, involving 2,953 children with congenital pathology, showed that the most common defects throughout the study period were defects of the interventricular septum (18.4%), interatrial partitions (11.3%) and tetrad of Fallot (11.8%). Every ten years there was an increase in the prevalence of defects of the interventricular septum by approximately 6%, whereas the incidence of pulmonary artery stenosis was steadily decreasing with time [20].

Thus, in countries far abroad, as

well as in Russia, there are significant fluctuations in the prevalence and primary incidence of CHD in different regions with the highest frequency in European countries, which may be due to good monitoring on the basis of a network of registers using modern diagnostic capabilities. In favor of this hypothesis is the tendency of the decrease in the frequency of CHD in Europe in recent years as a result of preventive measures aimed at replenishment of a deficiency of folic acid and trace elements in pregnant women. The most common CHD, as in the Russian Federation, were defects of the interventricular and atrial septa, valvular defects, pulmonary artery stenosis, and from the combined anomalies - the tetrad of Fallot

2. Prevalence and structure of congenital heart diseases in the Russian Federation

In the Russian Federation, in order to estimate the prevalence of congenital malformations on the basis of the Research Institute of Pediatrics and Pediatric Surgery of the Ministry of Health of the Russian Federation, a register has been created in which newly detected developmental abnormalities are recorded, including congenital malformations of the circulatory system in live births and stillbirths with a body weight in excess of 500 grams. During the study period from 2006 to 2012, registered 107 763 cases of congenital developmental disorders in thirty-one regions of the country [8]. The frequency of all detected defects in this period was in the range of 22.20- 0.90 per 1,000 children born, which is consistent with the indicator in various countries of Europe, where developmental anomalies occur, on average, at a frequency of 20-50 per 1000 newborns [30]. In the structure of congenital malformations, the cardiovascular system had the largest specific gravity - 18.1% [16].

Official statistics, according to the Central Research Institute of Informatization and Health Organizations of the Ministry of Health of the Russian Federation, show that the incidence of CHD among Russian children in 2014 was at the level of 400.5, and in 2015 - 439.0 per 100,000 children's population [12]. According to Demikova NS, in 2003 in the Russian Federation the average frequency of CHD was 4.5 ‰, and their absolute number reached 20-25 thousand children per year.

The prevalence of CHD in certain regions of the Russian Federation is marked by significant fluctuations. So, in the Krasnodar Territory in the period

of 1998-2009. the prevalence of the vascular system of the circulatory system averaged 7.96 per 1,000 newborns with a predominance of isolated interventricular septal defects in their structure that occurred in 51.7% of cases; on the second place were defects of the interatrial septum (16.6%). At the same time, there was a significant unevenness in the prevalence of vices in various territories of the region [1].

The prevalence of malformations of the cardiovascular system in children under the age of one year in Tomsk for the 8-year period (1999-2006) was 9.2%. There was an increase in the frequency of children with CHD in this age group from 5.41 to 12.75%, mainly due to atrial and interventricular septal defects, which can be largely due to the improvement of the quality of specialized cardiological care for the population of the Tomsk region on the basis of a specially created the CHD register [14, 17].

In the Volgograd region, the overall incidence of CHD among children between 2008 and 2011 statistically significantly exceeded the average Russian indicators: 1413.8 and 1280.3 per 100,000 children's population, respectively. The primary incidence of CHD in children was also significantly higher: 466.1 and 346.6.9 per 100 000 population, respectively. At the same time, the prevalence of CHD in adult residents of the region was significantly lower than in the Russian Federation (58.5 and 71.5 per 100,000 adults, respectively) [11].

When studying the structure of CHD among newborn children in Novosibirsk for the period from 2010 to 2013, hemodynamically significant defects were detected in 41% of 317 patients with CHD, and genetically determined pathology (chromosomal abnormalities) was confirmed in 15.4% of children, among them Down's syndrome was found in 12.3%. Heart defects in combination with other congenital anomalies were revealed in 10.8% of sick children, of them more than half of the cases were malformations of the urinary system. Defects of the interventricular septum (19.2%), atrioventricular canal (15.8%), transposition of the main vessels (14.8%) prevailed in the structure of the CHD. Hypoplasia of the left heart was diagnosed in 6.8% of children with CHD, the only ventricle in 5.7% of patients. In 14.8% of patients, multiple defects of the circulatory system were observed [5].

Among the newborns of the Perm Territory in 2005, CHD were diagnosed in 201 cases, the primary incidence rate was 13.4 per 1,000 children. Among children

under the age of 14 years, the prevalence of this pathology was at the level of 9.0 ‰. Defects of the interventricular and interatrial septa, as well as valvular defects predominated in the structure of the CHD: failure of the pulmonary artery valve, mitral and tricuspid valve (8.2%, 6.1%, and 5.2%, respectively). More than half of the cases were diagnosed with combined defects [15].

In Astrakhan Oblast in 2009, the incidence of CHD among newborns increased from 6.9 ‰ in 2009 to 9.4 ‰ in 2011. Of these, 25.9% had an interventricular septal defect, 20.7% had an atrial septal defect, and 8.2% had a Fallot tetrad [9].

The presented data testify to rather high rates of morbidity and prevalence of congenital heart diseases among newborns and children of the Russian Federation with a tendency to increase over the last decade and uneven distribution of these indicators in certain regions

Thus, monitoring can be considered as the main means for the prevention of congenital malformations, since an understanding of the role of risk factors and mechanisms of developmental malformations enables us to prevent or eliminate their harmful effects.

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ARCTIC MEDICINE

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RELEVANCE OF RESEARCH OF ANTHROPOMETRIC PORTRAIT AS A PREDICTOR OF REPRODUCTIVE MALE DISORDERS IN THE RS (YA)**ABSTRACT**

Literature review is based on the analysis of sources covering demographic situation, changes in hormonal regulation of the metabolic syndrome and the effect of the metabolic syndrome on the functions of the organism.

Keywords: metabolic syndrome, reproductive function, anthropometric indices.

At present, there are 146.8 million people living in Russia (according to the Federal State Statistics Service as of July 1st, 2017). Yet, since the beginning of 2017 the number of people in Russia decreased by 17 thousand, or 0.01% as a result of the existing natural population decline [29]. Russia has experienced several demographic crises, general demographic loss of Russia in the 20th century as a result of wars, famines, repression, economic and social turmoil is estimated at 140-150 million people. [6] Birth rate in Russia does not reach the level required for reproduction of the population.

According to the Federal State Statistics Service (FSSS) data for 2017, 962.8 thousand people live in the Sakha (Yakutia) Republic. The concepts of family and demographic policies of the Sakha (Yakutia) Republic until 2025 defines the general strategy, principles and priority directions of the state policy on family and demographic development aimed at increasing the life expectancy of the population, reducing the death rate, increasing the birth rate, regulating migration flows, and preserving and strengthening health of the population. [30]

Sakha (Yakutia) Republic is a region of the Far North with a subarctic, sharply continental climate. Changes in photoperiodism, low temperatures, increased humidity, and geomagnetic disturbances constitute a core set of environmental factors affecting the human body and having a negative impact on health [1]. To date considerable amount of material has been accumulated, indicating the formation of a specific northern hormonal profile with more actively functioning pituitary gland-adrenal cortex, decrease in insulin synthesizing function of the pancreas, high lability in thyroid and reproductive hormones numbers [3]. A complex of negative environmental factors affecting

the population of the region, as well as the effect of stressful social factors necessitates comprehensive research of public health. Research aimed at preventive measures for the diagnosis of morbidity proves the most relevant.

One of the most sensitive systems of the body reacting to the effect of environmental factors, regardless of their nature, is the reproductive system [28]. Accordingly, the study of the reproductive capacity of male and female population as objective factors of fertility decline is relevant.

Currently in the country there is a more or less developed system of prevention and treatment of reproductive health aimed at the female part of the population, but a similar system in relation to men is just beginning to be considered and put into practice. [10] In recent years, male reproductive disorders are of particular medical and social importance, since male infertility factor in married couples is 30-50% [19]. Male infertility is the result of a number of diseases and pathological effects on the male reproductive system [16, 23, 28]. In particular, it shows the effect of the metabolic syndrome as comorbid condition fertility in [9, 10]. Metabolic syndrome in men of young and middle age in 90.1% of cases is characterized by a violation of sexual function in general or its individual components [23]. Hormonal disorders and metabolic syndrome firstly cause adipopexia predominantly in the visceral area, and also insulin resistance, metabolic disorders and formation of systematic hyperinsulinemia [4, 11]. As shown by recent studies, adipose tissue has auto-, para- and endocrine functions and secretes a large number of substances that have different biological effects, which can cause development of obesity related complications, including insulin resistance. The most studied to date are tumor necrosis factor- α (TNF- α) and leptin. Many researchers view

TNF- α as a mediator of insulin resistance with obesity [4, 13]. Leptin secreted predominantly by adipocytes exerts its action on level of hypothalamus, affecting eating behavior, and the activity of the sympathetic nervous system, as well as several neuroendocrine functions [8].

Of the external factors that adversely affect the sensitivity of tissues to insulin, the most important are hypodynamia and excessive fat intake. It is estimated that in 25% of individuals leading a sedentary lifestyle, it is possible to detect insulin resistance [15, 27]. Excessive intake of animal fat containing saturated fatty acids leads to structural changes in cell membrane phospholipids and impaired gene expression controlling conduction of insulin signal inside the cell, i.e., to the development of insulin resistance [2, 12].

This is not an exhaustive list of possible insulin resistance development mechanisms in abdominal visceral obesity, which certainly calls for further research in this area.

Metabolic syndrome and obesity in general have become one of the major public health problems. According to WHO, the problem of excess weight affects more than 1.9 billion people, of which 600 million suffer from obesity. Morbidity and mortality among the population from diseases associated with obesity cause major damage to the economy (diabetes, cardiovascular diseases, etc.). Up until the early '90s we observed relative stability in northern populations, despite high levels of fats in the diet, related to diabetes mellitus, atherosclerosis and other diseases associated with obesity because of biochemical adaptability to protein-fatty diet type [5, 8, 15, 17]. With increasing urbanization and improvement of social living conditions minimizing the effects of cold on the human body, incidence of obesity, metabolic syndrome, type 2 diabetes, and atherosclerotic lesions of the cardiovascular system in population

in the regions with cold climates has sharply increased [22, 24, 26].

Anthropometric indicators are closely interrelated with the metabolic syndrome and obesity and hormonal imbalance, which can serve as predictors of reproductive system damage in andrological practice [7,18]. Morphophenotype (somatotype, body type) being a macromorphological subsystem of general constitution, forms its basis. Somatotype is an outer, most accessible to research and measurement, relatively stable in ontogeny and hereditary subsystem of general constitution and reflects the main features of the dynamics of ontogenesis, metabolism and reactivity [14, 18, 20, 25].

Analysis of scientific literature shows that there weren't studies conducted in Sakha (Yakutia) Republic showing the relationship of metabolic syndrome and reproductive disorders in young women in anthropometric aspect among the indigenous and non-indigenous populations. Research of individually-typological features of men in conjunction with clinical laboratory methods will allow to identify a number of morphological and anthropomorphic signs that can be considered as predictors of reproductive function disorder and important factors in family planning and birth of healthy children, early detection and prevention of infertility.

Thus, the study of this problem has social value as impaired fertility leads to an increase in the number of sterile marriages, small families and causes deterioration of country's demographic indicators.

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BREASTFEEDING: DIFFICULTIES OF THE ORGANIZATION AND MODERN WAYS TO SOLVE PROBLEMS OF 10 PRINCIPLES OF SUCCESSFUL BREASTFEEDING IMPLEMENTATION

ABSTRACT

This article discusses the issues of one of the topical problems of medicine – the organization of breastfeeding (BF). BF is the «gold standard» of optimal nutrition. The type of nutrition largely determines the state of health of the child not only at an early age, but also in further period of his life. The authors aimed to assess the current state and effectiveness of current practice and the system of support for BF, and also to identify the problems of implementing the ten principles of successful BF in the Republic of Sakha (Yakutia). The results of the questionnaire of lactating woman and medical staff in the obstetric department of the «Yakutsk City Clinical Hospital» (YaCCH), Polyclinic No. 1, which received the status of «Child Friendly Hospital» (CFH). With the receipt of the status of the CFH of the above-mentioned hospitals, the prevalence of BF increased. The analysis of women motivation, the duration, reasons for stopping BF, medical staff training on BF questions, the impact of each object (lactating woman, doctor, nurse) on the duration of breastfeeding. Difficulties in organizing of ten principles for successful breastfeeding introduction have been identified. The main reasons for stopping and transition to mixed feeding are subjective signs of a lack of milk, which could be eliminated with proper counseling. The level of knowledge of physicians on BF affects the level of knowledge of nursing staff; the latter in turn affects the frequency of conversations with mothers. The nursing staff in this situation is a support point for lactation in women. In the current practice of BF, the process of educating and motivating pregnant women at the level of women's counseling, the poor training of young professionals when entering the workforce, especially the nursing staff, the inadequate consultation on BF with preterm birth, the lack of a support group of mothers with positive experiences of breastfeeding.

Keywords: breastfeeding, lactation, WHO, newborns.

INTRODUCTION

In Russia, the problem of establishing breastfeeding is very relevant. According to the Government of the Russian Federation in 2010, only 41% of children received breastmilk in Russia, while in some European countries this figure reaches 98% [1]. One of the main reasons for stopping BF is maternal ignorance. Often doctors do not pay attention to this problem. Meanwhile, the main role in the promotion of BF should be played precisely by medical personnel and healthcare organizers, as well as by BF consultants from those mothers who had positive experience, who could teach mothers the methods of BF [3]. According to Abolyan L.V., there is no unified system of training medical personnel for BF. There is also no official national program on BF, according to which attestation of medical institutions would depend on the coverage of BF [2].

MATERIALS AND METHODS OF RESEARCH

We developed a questionnaire based on WHO recommendations. The questionnaire met the standard requirements for this method of research: filling time about 20 minutes; availability of questions that are understandable to most respondents on this topic. The main part of the questionnaire included questions about well-known and generally accepted positions on BF that do not require any special knowledge; theoretical and practical questions on the knowledge of recommendations for supporting lactation and assessing

its adequacy. A retrospective cross-sectional study was conducted. The survey was conducted in the obstetric department of the «Yakutsk City Clinical Hospital» (YaCCH), and Polyclinic №1, which were received the status of «Child Friendly Hospital» (CFH) for the period 2016-2017. The inclusion criteria were: a woman after childbirth and breastfeeding; Doctors and nurses working in these hospitals. A total of 300 respondents: 200 lactating mothers – 140 (70%) were interviewed in obstetric department, 60 (30%) in the polyclinic who gave birth in the obstetric department of the YaCCH, 100 medical workers – 76% from the YaCCH staff, and 24% from the polyclinic. Statistical processing of the results of the study was carried out by the SPSS-16 program. To assess the association of qualitative and correlation of quantitative traits, Spearman's nonparametric analysis was used, indicating the value of the degree of correlation (r_s). The degree of correlation was estimated as weak at $r_s \leq 0.25$, moderate at $0.25 < r_s < 0.75$ and strong at $r_s \geq 0.75$. The level of statistical significance p was calculated for all statistical analysis procedures, the critical level 0.05 was adopted.

RESULTS AND DISCUSSION

The prevalence of BF in the CFH has a tendency to increase over the past 13 years, from 75.2% to 98.3% in the obstetric department in Yakutsk and in the Polyclinic № 1 till 6 months old from 50.2% to 60.3%, till 1 year age from 31.0% to 59.8% (chart 1). The status of the CFH of the above-mentioned hospitals was

received in 2012 and confirmed in 2015 in the YaCCH. Polyclinic №1 did not pass the confirmation procedure.

Among the interviewed lactating women, 76 (38%) are employees, 48 (24%) female are students, 19% housewives, 12% workers, 5% unemployed, 2% individual entrepreneurs, 42% with higher education, 28% special secondary, 20% incomplete higher education, 10% without education. The median age was 29 (18; 47) years. 168 (84%) of women with repeated delivery, 148 (74%) were naturally given birth, 152 (76%) on time.

An analysis of the motivation for BF of lactating mothers revealed that only 128 (64%) had a desire to breastfeed for a long time, 72 (36%) women had low motivation, 36 (50%) of whom had repeated childbirth. The degree of correlation of natural birth and lactation motivation was moderate - $r_s = 0.26$ ($p < 0.009$). 48% of women had full knowledge of the rules of successful breastfeeding. Only 21% of women visited their mother's school during pregnancy. Among the sources of information about BF, women in our study were called doctors 74 (37%), nurses 66 (33%), parents 26 (13%), special literature 38 (9%), media 8 (4%). 112 (56%) of respondents defined their lactation process as having no problem and not requiring support. 88 (44%) women needed help at the first stage, the main problems were inability to express milk – 48 (54.5%), lack of milk – 22 (25%), lactostasis – 26 (29.5%).

A total of 80 (47.6%) maternity females had a positive history of lactation and fed

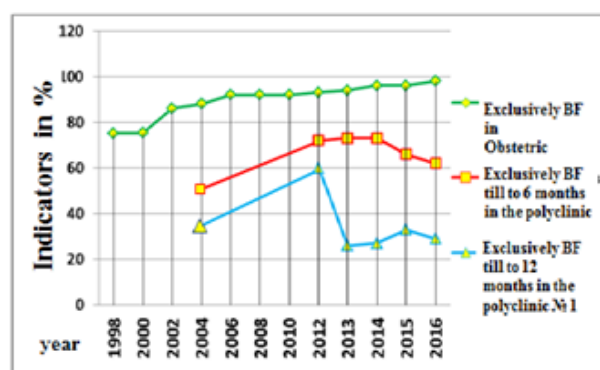


Figure 1. The prevalence of BF in Hospitals with the status of «Children friendly hospital» for 13 years

their children for a long time. The average duration of lactation was 11 ± 1.3 months. Out of 60 women respondent in the polyclinic 18 (30%) had already stopped breastfeeding at 3 months, 15 (25%) were on mixed feeding. The reason for the transition to artificial feeding was hypogalactia, in 94.4% of cases this complaint was purely subjective and not supported by objective signs of lactation insufficiency. For this, it is necessary to evaluate two fairly simple objective criteria - an increase in body weight and the frequency of urination. The reason for transition to mixed feeding is a lack of milk 8 (53.3%), refusal of the baby from the breast 2 (13.3%), hyperbilirubinemia syndrome with a temporary transition to artificial feeding 5 (33.4%).

Among the interviewed medical staff, doctors accounted for 68%, the nursing staff 32%. Most doctors had more than 10 years of work experience (61.8%), 53.1% of nursing staff less than 5 years. Almost all the medical personnel did not doubt the advantage of BF. The full level of knowledge of the «10 principles of successful BF», the support of women in the event of problems and the solution of the majority of issues of preserving lactation among doctors showed 36 (52.9%), incomplete knowledge of 32 (47.1%), among nurses 8 (25%) and 24 (75%), accordingly. The degree of correlation between the level of knowledge of medical staff and the work experience, the availability of a qualification category was $-rs = 0.525$ ($p < 0.001$); The level of knowledge of the doctor and the level of knowledge of nursing staff was $-rs = 0.615$ ($p < 0.001$); The level of knowledge of the nursing staff and the frequency of the conversation with mothers on BF questions was $-rs = 0.528$ ($p < 0.001$); Level of mother's knowledge about

BF and motivation for breastfeeding $-rs = 0.289$ ($p < 0.05$); Frequency of conversation between medical staff and duration of feeding $-rs = 0.75$ ($p < 0.001$); Motivation for BF and duration of BF $-rs = 0.826$ ($p < 0.001$); A moderate negative correlation is determined between the frequency of premature birth and the duration of feeding $-rs = -0.473$ ($p < 0.001$).

WHO in the last paragraph of the «10 principles of successful BF» recommends the creation and promotion of maternal groups supporting breastfeeding, but according to the results of the questionnaire, this item did not have a positive response from the respondents.

CONCLUSION

1. Prevalence of HB for 13 years in the primary link tend to increase. Before to obtaining the status of the CFH, the coverage rates of children with a natural feeding were low. The set of measures taken by the Healthcare Ministry of RS (Y) to support the BF gave positive results and led to the fact that the highest figures were achieved in recent years.

2. Low motivation of mothers for BF leads to a decrease in the duration of breastfeeding. The main reasons for stopping and transition to mixed feeding are subjective signs of a lack of milk, which could be eliminated with proper counseling.

3. The level of knowledge of physicians about BF affects the level of knowledge of nursing staff, the latter in turn affect the frequency of conversation with mothers about BF issues. The nursing staff in this situation is a support point for lactation in women. From here follows an important recommendation for the heads of departments and doctors about the necessity to train nursing staff for all BF skills.

4. The existing practice of the BF does not fully implement the protocol for implementing the «10 principles of successful BF»:

- the point of training and motivation of pregnant women in the BF is affected (work of the women's consultation);
- poor-quality training of young professionals when entering the workforce, especially nursing staff;

- a fairly high percentage of children born prematurely is lost due to inadequate care at all stages – training in expressing milk, absence of joint mother and premature baby in intensive care beds, «Kangaroo» contact;

- the lack of a support group for BF from among mothers with a positive experience of breastfeeding. Given that the transfer of the mother's experience of breastfeeding from mother to mother, from the older generation to their children most often does not require any specialized intervention of medical workers, it is necessary to create, through modern means of communication, maternal groups supporting breast-ligation at the local level.

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SCIENTIFIC REVIEWS AND LECTURES

A.V. Rybochkina, T.G. Dmitrieva, N.N. Innokentieva

PATHOLOGY OF THE DIGESTIVE SYSTEM
IN CHILDREN WITH OBESITY

ABSTRACT

The article presents a review of the literature about lesions of the digestive system at metabolic syndrome with clinical, laboratory, instrumental and morphological positions.

Pathogenetic mechanisms of development of the metabolic syndrome, complications of the digestive system are considered against its background, as well as the risk to human health in the presence of abdominal obesity.

Recent studies have shown a high incidence of comorbid complications in adolescents with obesity, which makes it possible to treat MS as an important pediatric problem.

Keywords: children, obesity, digestive organs.

INTRODUCTION

In many countries in recent decades there has been an increase in the number of patients with overweight and obesity, including childhood and adolescence.

According to the world health organization (WHO) in 2014, around 41 million children under the age of 5 were overweight or obese. Overweight and obesity, previously considered typical of countries with high income, are now becoming more common in countries with low and middle income, especially in the cities. In Africa the number of children who are overweight or obese has almost doubled — from 5.4 million in 1990 to 10.6 million in 2014. In 2014 almost half of children under 5 years are overweight or obese lived in Asia [12].

According to forecasts, by 2025 obesity will suffer 40-50% of the world population. The world health organization has recognized the obesity epidemic of the XXI century.

In the Russian Federation also an increase in the number of children and adolescents with overweight and obesity is noted. According to data published in 2014, the study, which involved more than 5,000 children aged 5, 10 and 15 years from Astrakhan, Yekaterinburg, Krasnoyarsk, Samara and St. Petersburg, it was found that among children of both sexes and all age groups, the prevalence of overweight is 19.9%, and the prevalence of obesity was 5.7% [38].

In the 2015-2016 academic year for the first time in Kazakhstan national center for problems of healthy lifestyle conducted a study within the multicenter study of the prevalence of childhood obesity among children according to the methodology of the who COSI. According to the study, the prevalence of overweight, separately for boys and girls 9 years was 12.7% and 12.0%, respectively, obesity among boys and girls 9 years to 7.1% and 5.5%, respectively [3].

Currently a comorbid disease is a topical problem of medicine not only in Russia but throughout the world [2].

It is known that obesity is accompanied by damage to almost all organs and systems, including the digestive system. Fatty tissue affects the digestive system both mechanically and due to the metabolic action [31].

Studies of comorbidity, published in recent years, indicate the correlation of metabolic syndrome with typical gastrointestinal manifestations [24].

According to the data [26] metabolic syndrome (or syndrome of insulin resistance) in the current literature involves complex of metabolic, hormonal and clinical disorders, closely associated with diabetes type 2, and are risk factors for the development of cardiovascular diseases, which is based on insulin resistance (IR) and compensatory hyperinsulinemia (HI).

For the first time this syndrome has been described in the 60-ies of the last century and included a combination of non-insulin dependent diabetes mellitus, gout and hyperlipidemia.

In the 1980-s G. M. Reaven suggested that a combination of violations glucose tolerance, dyslipidemia and hypertension was associated with reduced sensitivity of tissues to insulin – insulin resistance [9, 46, 47].

Unfortunately, up to the present time, no single criteria have been developed to diagnose MS in children. One of the most universal classifications proposed for use in pediatric practice is the classification developed by the International Federation of Diabetes (IDF) in 2007 on the basis of similar criteria for MS for adults.

According to these recommendations MS in adolescents of 10-16 years may be diagnosed at the presence of abdominal obesity (waist circumference more than 90 percentile) in combination with at least two of the following indices:

- triglycerides ≥ 1.7 mmol/l;
- the level of high-density lipoproteins < 1.03 mmol/l;
- increased blood pressure $\geq 130/85$ mm Hg. article;
- increase in glucose venous plasma fasting ≥ 5.6 mmol/l or diagnosed DM of the 2nd type and/or other disorders of carbohydrate metabolism [9].

The prevalence of diseases of digestive organs, according to official statistics in the Republic of Sakha (Yakutia), 2006-2012 on applications made 90-150 per 1000 of children population.

In the study of Berezkina O. N. [6] of 103 examined children 74 children had chronic *H. pylori* associated gastritis (44 urban students and 30 – SEL). Urban residents prevailed erosive forms (80 %), rural – non-erosive forms of gastritis (70 %).

There were noted diseases of the esophagus: gastroesophageal-reflux disease (7.8 %), reflux esophagitis (18.4 %), and reactive pancreatitis – (63 %), duodenitis (20 % of all patients), dolichosigma (2 %), dyskinesia of the large intestine (4.9 %), malabsorption syndrome (0.9 %). In 3% of children post-traumatic gastritis was reported.

Besides, in Yakutia works for the study of regional features of lipid - metabolic risk factors of cardiovascular diseases were carried out, the association of single-nucleotide polymorphism rs1137101 gene leptin receptor and rs9939609 gene associated with fat mass in individuals of Yakut ethnicity was investigated [2, 19, 20].

According to Sozonova K. K. (2014) in Yakutia the prevalence of abdominal and general obesity ($BMI \geq 30$ kg/m²) in the indigenous is lower than that of the non-indigenous.

Level of cholesterol lipoproteid of low density (LDL cholesterol) in the Yakut population is high, but MS is not very different from population values and

values in individuals without MS, which allows to admit the unjustified inclusion of the LDL cholesterol criterion in the list of MS definitions [36,37].

At the same time questions of the MS prevalence among the child population of the Sakha Republic (Yakutia) remain poorly studied, and the pathology of digestive organs in obese children in this territory has not been yet studied.

According to the Central research institute of gastroenterology, nosological structure of diseases of digestive organs in MS patients is represented by the following triad: diseases of the esophagus, including gastroesophageal reflux disease (GERD) – 72% of cases; the liver and biliary tract – 64%; colorectal – 68% of cases [9].

Overweight and obesity are proven risk factors for such diseases of the esophagus like GERD, Barret's esophagus (BE) and adenocarcinoma of the esophagus (ACE).

Gastroesophageal reflux disease is «a chronic inflammatory disease characterized by defined esophageal and outer-esophageal clinical manifestations and a variety of morphological changes of esophageal mucosa due to retrograde reflux of gastric or gastric -intestinal content» [21, 35].

The study of V. G. Borodina, T. V. Stryukova (2014) revealed no strict dependence between the frequency of clinical symptoms of GERD (heartburn, epigastric pain and other dyspeptic complaints) and physical development of children, but with an excess of body weight there was a trend to increased frequency of heartburn at reducing the amount of other dyspeptic manifestations (at 87.5 and 43.7%, respectively) [10, 32].

Obesity is an independent factor in the formation of diaphragmatic hernia. Diaphragmatic hernia is more often diagnosed in patients with symptomatic GERD, as well as in patients with pathological acid reflux. Patients with diaphragmatic hernia often suffer from esophagitis and have a marked decrease in pH in the lower esophagus compared to those without disrupting the function of the lower esophageal sphincter (NPS) [10].

Visceral fat is a metabolically active substance that causes a decrease in the serum level of protective cytokines (adiponectin) and an increase in the level of inflammatory cytokines (TNF- α , IL-1 β , IL- β) [35].

According to I.Yu. Usanova et al. (2013), in patients with GERD of young age and overweight by the results of

pH-metry, alkali reflux occurs in 62% of cases, which can be explained by an increase in intra-abdominal pressure and casting of the alkaline contents of the duodenum into the lumen of the stomach and esophagus [39].

The study of A.S. Asekritova (2015) revealed that in Yakuts with a metabolic syndrome, gastroesophageal reflux disease is characterized by a more severe clinic with a high incidence of dyspeptic and extra-esophageal manifestations compared to Yakuts without MS. Yakut people with GERD, regardless of the presence of MS, are twice more likely to have non-erosive esophagitis than Russians [2].

Diagnosis of GERD in children and adolescents with obesity can be difficult due to the lack of specific complaints. Child's complaints about discomfort and abdominal pain parents can associate with a violation of the quantitative and qualitative characteristics and diet, which, as a rule, take place in the majority of children with excess body weight [4, 8].

At the same time, researchers agree that without correction of body weight in such patients, GERD remission is almost unattainable. In particular, Italian scientists have studied the effect of weight loss on the control of GERD symptoms, as well as the dynamics of the frequency of using proton pump inhibitors against the background of weight loss in 50 patients who were diagnosed with erosive lesions of the esophagus [33].

The presented results indicate a possible relationship of GERD in children with an increase in body weight. Early diagnosis and treatment of GERD, including weight correction, are needed to prevent severe complications of the disease in adults. It is likely that in children, compared with the adult population, in studies to identify signs of reflux, the primary use of non-invasive methods is needed, as well as the use of more sensitive indicators, such as visceral fat assessment [32].

Investigation of the pathology of the gastrointestinal tract with obesity can reveal frequent damage to the stomach (up to 72%) and duodenum (66%). Pancreatic diseases are observed in 18% of patients, and prevail in the female sex (6: 1) [33].

Endoscopic picture at obesity is characterized by the presence of atrophic gastritis, single and multiple erosions, single polyps of the stomach, the formation of ulcers of typical localization.

There is a high incidence of *H. pylori* infection with metabolic syndrome, insulin resistance and diabetes mellitus [12].

H. pylori in the body is considered as a trigger switching on a cascade of pathological reactions: it initiates the process of chronic inflammation, promotes the increase in the level of pro-inflammatory cytokines, adhesion molecules, growth factors and acute phase proteins, which in turn stimulate inflammatory and proliferative changes in the walls of the vessels and cause endothelial microvascular dysfunction, exacerbating metabolic disturbances [28, 41].

Regulation 16 of the Kyoto Consensus includes a recommendation to carry out in view of the epidemiological situation scoring against *H. pylori* at the age at which the phenomena of atrophic gastritis and intestinal metaplasia have not yet developed (the degree of recommendation is strong, the level of evidence is moderate, the level of consent - 97.3%). It is noted that such screening is most expedient to be carried out when the probability of occurrence of new cases, *H. pylori* associated gastritis (over the age of 12 years) decreases [42].

Non-alcoholic fatty liver disease (NAFLD) is one of the most common chronic liver diseases in the world. According to the classification of the Russian gastroenterological association (RGA) in 2016 V.T. Ivashkina et al. identified the main clinic-morphological forms of NAFLD: fatty steatosis (hepatosis), which in most cases has a benign course, as well as non-alcoholic steatohepatitis (NASH), characterized by the potential for progression to cirrhosis and hepatocellular carcinoma [18, 46].

Liver steatosis is a pathological deposition of fat droplets inside and outside the liver cells with the development of fatty degeneration of hepatocytes.

Nonalcoholic steatohepatitis (NASH) - necrotic inflammatory changes in hepatocytes due to the action of toxic agents similar to the picture of alcoholic hepatitis in patients not abusing alcohol.

In children and adolescents, NAFLD is characterized by a chronic course and global spread [11, 21].

Recent studies using magnetic resonance imaging and liver histology have shown that liver steatosis is closely related to pancreatic steatosis [21].

It is assumed that both these diseases have a single mechanism of development associated with metabolic changes developing against the background of excessive deposition of visceral fat, whose increased functional activity leads to disruption of autopaendocrine regulation, the leptin mechanism of

control of food behavior, the development of cytokine-induced Insulin resistance and chronic inflammatory process due to an imbalance between the level of adipo-cytokines with an increase in the concentration of pro-inflammatory leptin and Resistin and a decrease in the level of anti-inflammatory adiponectin, and also causes oxidative stress, which leads to the development of chronic pancreatitis and steatosis [43].

Clinical manifestations of pancreatic steatosis are β -cell dysfunction, exocrine pancreatic insufficiency, an increased risk of fistula formation after pancreatic surgery, a high risk of developing pancreatic cancer, a significant severity of episodes of acute pancreatitis [43].

Numerous studies in adult patients indicate the association of pancreas steatosis with old age, higher body mass index, abdominal circumference, the ratio of abdominal circumference of growth, hyperglycemia, hypertension, hypercholesterolemia, and hypertriglyceridemia, hepatic steatosis, increased level of alanine aminotransferase (ALT), A violation of tolerance to glucose and diabetes [16].

In children, pancreas studies at adiposity and metabolic syndrome are single [1, 14].

In the study of E.I. Aleshina, V.P. Novikova (2014) et al., coprologically pancreatic syndrome was detected in 23.3% of obese children and in 7.5% of children with a normal body mass index (BMI). These results are consistent with the indices of feces elastase activity [1].

According to the ultrasound changes of the pancreas in children with obesity significantly more often than in children with normal BMI changes of echostructure and echogenicity of the pancreas, increasing of its size were detected. They also had more increased size of the tail of the pancreas. The incidence of pancreatic steatosis in obese children reached 70% (according pathognomonic term - hyperechogenicity compared with renal parenchyma) [1, 13, 48].

The pathogenesis of non-alcoholic fatty liver disease (NAFLD) is the accumulation of an excessive amount of triglyceride (TG) and cholesterol other derivatives in hepatocytes due to imbalance between the synthesis and utilization of these organic molecules [7].

There is no single well-studied mechanism for the development of NAFLD: it is a complex multifactor process. Insulin resistance and the change in hormone profile - fat metabolism regulators (leptin, adiponectin etc.) are considered as its main component [7, 10,

19, 44].

Numerous clinical studies have shown that metabolic abnormalities in the liver are often associated with disorders of the intestinal microbiocenosis. In the formation of steatosis and steatohepatitis secrete exogenous risk factors - excessive intake of hepatocyte intestinal lipid hydrolysis products (fatty acids), glucose, fructose, galactose, alcohol, and endogenous - increasing concentration and disruption of fatty acid oxidation in the hepatocyte, the accumulation in hepatocytes of triglycerides, relative or absolute deficiency of apoproteins B, complement components of C1-C3. The maximum expression of bacterial growth is observed in patients with NASH with an outcome in the liver cirrhosis [34, 41].

According to the data of T. A. Bokova (2013) the nature of food has a direct effect on the composition of the microbiota. Thus, the consumption of high-calorie food, characteristic of obese patients, leads to a decrease in the level of bifidobacteria and a shift towards one subspecies of Firmicutes, namely *Erysipelotrichi*, an increase in the level of endotoxins in intestinal contents and blood [9].

In the study of Kurmangulov A.A., Dorodnina E.F., Isakova D.N. (2016) in all groups with an excess of body weight there was a decrease in the total metabolic activity of obligate microorganisms. With obesity of the 2nd degree, the activity of aerobic populations of microorganisms, mainly facultative and residual strains, increases. MS with obesity of the third degree is accompanied by the most significant changes in the coprological profile of short-chain fatty acids (CLC) with the activation of proteolytic microorganisms [19].

Complaints of patients are nonspecific and do not directly indicate a liver disease, first of all manifestations of asthenic and dyspeptic syndrome, discomfort in the right hypochondrium, hepatomegaly in approximately 50-75% of patients [21].

A family history of NAFLD can also help in diagnosis, because related chains are often found [15].

At physical examination acanthosis nigricans, skin pigmentation, from velvety brown to black or «dirty» areas of the skin is often found. Typical localization is skin folds and nape, shoulders, axillary fossa, in the body in combination with papillomatosis. Acanthosis nigricans can be observed in a greater proportion of children with NAFLD [21].

In contrast, patients with NAFLD have no skin signs typical of other chronic liver diseases, such as palmar erythema or

«spider veins» [13].

At steatosis and NASH, there is a moderate increase in the liver, its edge is round, and the consistency is doughy [40].

The activity of alkaline phosphatase (APH) increases in less than 50% of patients, and the level of bilirubin increases even more rarely. The level of albumin in the blood almost always remains within normal limits. Elongation of prothrombin time is not characteristic for NASH. Determination of liver enzymes (AST and ALT) in combination with ultrasound examination of the liver has been shown to all obese patients for screening of non-alcoholic fatty liver disease [22].

At the stage of steatohepatitis, an increase in the activity of transaminases from two to 4-5 norms is possible, but at the stage of steatosis the indices are not changed.

To identify and evaluate steatosis, visualizing methods are recommended: ultrasound, computed tomography, magnetic resonance imaging [5].

Sensitivity and specificity of ultrasound in NAFLD vary depending on the degree of steatosis and range from 60-90% to 90-97%, respectively [17].

The sensitivity and specificity of ultrasound in the pathology of the gall bladder make up 90%. The method allows to assess the condition of the gallbladder wall, its shape, the presence of deformations, visualize the stones in the cavity of the bladder or ducts, determine their size and quantity. In addition, when performing ultrasound, it is possible to diagnose «non-homogeneous bile» and «disconnected» gallbladder [9].

In this regard ultrasound can be a screening method for detecting liver steatosis.

Due to the fact that instrumental methods for NAFLD diagnosing are not strictly specific, one of the important and controversial issues is the need for using liver biopsy in patients with childhood suspected of having NAFLD.

According to Y. Ikura (2014), biopsy is not mandatory for diagnosis if the patient is in the classic case of fatty liver damage - a moderate change in hepatic enzymes, the presence of classical risk factors (obesity, type 2 diabetes, dyslipidemia) and Typical data of ultrasound were revealed [45].

The principles of treatment of GERD within the metabolic syndrome consist in the appointment of adequate doses of proton pump inhibitors (PPI). It should be noted that even long-term therapy with PPI in a sufficient dosage without

correcting the body weight of the patient does not lead to stable remission [10].

Regular exercise of adequate physical exercises leads to an improvement in the histological picture of the liver in NASH even without a clinically significant decrease in body weight, and also contributes to a decrease in serum cholesterol level [30].

It should be remembered that pharmacological preparations are only an addition, not an alternative to changes in diet and physical activity, and the spectrum of medicines used to correct lipid and carbohydrate metabolism disorders in childhood is very limited [5, 25, 27, 44].

According to the recommendations of the International Hepatology Congress EASL (Barcelona April - 2016), the most actual and effective way to treat NAFLD is a lifestyle change that includes a hypocaloric diet, aerobic activity [30].

Treatment of NAFLD should begin with the cancellation of all potentially hepatotoxic drugs, the appointment of hypocaloric diet and correction of excess body weight, which leads to an improvement in the functional state of the liver.

It is necessary to treat the concomitant conditions associated with the development of NASH (type 2 diabetes mellitus, atherogenic hyperlipidemia, hypercholesterolemia, obesity).

Widely are used means of metabolic therapy (alpha-lipoic acid drugs), hepatoprotectors-antioxidants (ursodeoxycholic acid (UDCA), hypolipidemic therapy (statins), probiotics (lactulose) [17, 29].

The data obtained suggest the presence of pathogenetic determinants between obesity in MS and microbiota of the intestine. In connection with this, further search for cause-effect relationships of the occurrence and progression of metabolic disorders involving the intestinal microbiota at MS is needed [23].

Obesity contributes to the emergence and progression of diseases of all parts of the digestive system, characterized by the same type of changes in the digestive system in the form of motor disorders, erosive, and in some cases - severe atrophic lesions, against a background of significant microcirculation disorders; frequent pathology is esophageal leukoplakia or hyperkeratosis, Barrett's esophagus, esophagus polyps, in some cases - adenocarcinoma [34].

CONCLUSION

Thus, recent studies have shown a

high incidence of comorbid complications in adolescents with obesity, which makes it possible to treat MS as an important pediatric problem. Only joint activity of pediatricians with endocrinologists, gastroenterologists, cardiologists will allow fully studying the basic pathogenetic mechanisms of MS formation, to isolate the spectrum of clinical manifestations, while focusing on earlier symptoms, which are predictors of its development in children.

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RELEVANCE OF RESEARCH ON TREATMENT OF PURULENT SKIN WOUNDS WITH NATURAL SORBENTS

ABSTRACT

Review of literature is based on the analysis of sources covering the mechanism of purulent wound progress and choice of effective means of local treatment. We present topical issues for further research of the problem.

Keywords: wound process, sorbents, Khongurin zeolite.

Currently wound treatment is one of the most major problems of surgery. With all the success in the development of surgical techniques in recent decades, the number of patients with purulent wounds of different etiologies has not decreased. [1, 17, 31].

The most promising and active of systemic exposures was the use of antibiotics to fight the infection. Unfortunately, removing the infection this way was not prospective, because the microorganisms that cause the infectious process mutate and become resistant to known antibiotics. High resistance to antibiotics and other antimicrobials of many modern strains of bacteria, pathogens of purulent infection dictate the need to find new ways to intervene in the microflora of purulent wound during its topical treatment. [2, 3, 8].

It is known that wound healing process is essential for normal function of the organism. It is a manifestation of biological adaptation, without which complex multicellular organisms could neither evolve nor survive [7, 32]. Clinical, anatomical and pathohistological characteristics of these stages are described in numerous papers by

prominent scientists.

Currently we use the classification of M.I. Kuzin (1990): Phase I (inflammation) is the melting of necrotic tissues, their removal, i.e. purification of the wound defect. In the initial phase of inflammation an important part of the defensive reaction of the body is the formation of exudate. Serous exudate to some extent neutralizes the products of cellular and tissue decay, and antibodies and enzymes in the exudate contribute to the disinfection of the pathogenic factor and the removal of nonviable tissues. The process of absorption and digestion of microorganisms and nonviable tissues is the central link of the inflammatory process. The main role in the purification of the wound is performed by leukocytes, lymphocytes, and macrophages, during decay of which about 40 hydrolases enter the wound. In addition, the microbial factor actively participates in the lysis of nonviable tissues and the purification of the wound; it acts as a "biological purifier". Thus, in the first phase of wound healing main efforts of organism defense mechanisms are directed towards removing destroyed tissue from the inflammation area in the wound, as well

as toxic products formed in the wound. Phase II (regeneration and maturation of the granulation tissue) begins 2-3 days after injury. Granulation tissue is formed as separate foci at the bottom of the wound and is characterized, firstly, by an intensive neoplasm of capillaries. Their elaboration occurs within 7-9 days. By the end of the second week regenerative processes are nearing completion and, with the increase in collagen fibers, granulation tissue becomes denser. Phase III (scarring and epithelization) occurs by days 19-22, when the wound defect is closed and completely epithelialized. Granulation tissue is converted into mature fibrous tissue, poor on blood vessels, with coarse collagen fibers and fibrocytes [19, 20, 21,30].

Wound shrinkage (contraction) processes play an important role in the reorganization phase. The edges of the wound are reduced thanks to a special area of centripetally-located fibroblasts (miofibroblasts sensu J.Jobiani, 1972) [20, 21].

The mechanism of wound process progress and its clinical picture requires, first and foremost, the use of mechanical removal of altered wound tissues and

then local use of medicinal treatment, in particular ointments or powders. The disadvantage of both ointments and other means for local application is considered to be unidirectionality of their action, short time of active influence on the wound, "attachment" of medication to the wound process phase, complexity of applying some of the medications. In most cases, frequent dressings and proper assessment of the wound condition are required, which requires specialized knowledge [4, 27, 29, 30].

Practical significance comes from techniques that are convenient and universal in use, which do not require special approaches and methods of application. They can be used in outpatient treatment settings and in cases of localized purulence of soft tissues and primary purulent processes. Thus, the urgency of further development of effective local treatment of purulent wounds is ostensible.

One of the areas in treating wound infections is the use of sorption-active substances and their various modifications that have combined effect on the course of wound healing process [4]. According to the results of a large number of experimental and clinical work, natural zeolitized rocks have proven to be effective sorbents. Zeolite-containing sorbents remove most of the toxic components of endogenous and exogenous origin from the organism. In addition, among its palpable advantages are: high efficiency, simplicity, affordability, absence of allergic and other side effects. [22, 23, 24, 28, 33]. Use of zeolites in medicine was pioneered by Russian surgeons (M.S. Lubarsky, N.I. Bogomolov, and E.M. Blagitzko). M.S. Lubarsky et al. used the natural zeolite in the form of fine powder in admixture with a proteolytic enzyme for treatment of purulent necrotic wounds [20, 26].

Zeolites deposit in the Sakha (Yakutia) Republic was first discovered in 1978 by geologists of the Yakut Institute of Geological Sciences of the SB of RAS in the Suntarsky area. This is one of the largest predicted resources (approximately 3.5 bln. t.) site. Kempendyaysky zeolite-containing region, which currently hosts the Khonguruu, Ulakhan-Uottakh, Soros, and Chuchuba deposits. The most studied zeolites come from the Khonguruu deposit; its reserves are estimated at 51 mil. t. [9-13, 15]. Since 1991, the Yakut Scientific Center of the Russian Academy of Sciences has been conducting systematic research to identify fields

of practical application for Khonguruu (Khongurin) deposit's zeolite in different areas of production. Currently the Yakut zeolite is widely used in agriculture and veterinary of the Republic [14-16]. Zeolite materials of the region, in contrast to other examples known in Russia and the CIS, is characterized by exceptionally high content of clinoptilolite. Thanks to the aluminosilicate framework structure Khongurin has high adsorption properties [9]. In scientific literature, there are one-off works on the study of Khongurin zeolite for prevention and treatment of pathological conditions [5, 6, 18, 25].

Due to the fact that the studies of Yakut zeolites' effect on wound processes progress (Khongurin) have not been conducted, we see it as a good chance to examine the morphology of the inflammatory processes in the correction of the drainage-aspiration material based on the Khongurin zeolite.

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CLINICAL CASE

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M.N. Andreev

ACUTE HDV INFECTION ON THE BACKGROUND OF CHRONIC HDV-INFECTION IN PREGNANT WOMAN

ABSTRACT

Republic of Sakha (Yakutia) is the region with threatening situation in viral hepatitis' morbidity. According to chronic viral hepatitis register of Yakutia in 2016 14391 cases had been registered (without HBV carriers – 580), HBV – 6404, HCV – 6224, HDV – 889, mixt – 821, unverified – 57, with liver cirrhosis – 544 and with primary liver cancer – 69. Majority belongs to HBV-infection (44%) [2,5].

Variant of mixt-infection in pregnant is HDV (delta-hepatitis). This virus had been discovered in 1977 by M. Rizetto and his distinguish is he needs HBV to replication process [1,3,4]. Special value belongs to vertical transmission (from mother to child), 25% of carriers infected in perinatal period [3,6,7].

Aim of study is description of acute HDV infection on the chronic HBV-infection background case.

MATERIALS AND METHODS

Information from in-patient and outpatient medical records in Yakutsk city clinical hospital viral hepatitis department and medical records about pregnancy and delivery (National center of Medicine) had been investigated. Full specter of clinical, instrumental, serological and molecular methods had been used.

Clinical case:

We present clinical case of HDV superinfection on the background of HBV in pregnant woman.

Z., 26 years, delivered by medical aviation from Ust'-Aldan Central hospital with directional diagnosis: Pregnancy 21 week. Head presentation. Compromised obstetrical anamnesis. Threatening of premature delivery. Pregnancy hepatitis? Chronic HBV-infection. 1st degree anemia.

From anamnesis: fatigue during last month, low appetite, weight decreasing for 2 kg, jaundice and itching, leg swelling. Hospitalized with complaints to cramping pains in the lower abdomen, bloody spotting. By medical aviation transported to National Medical Center Dept. of obstetrics. There complaints low appetite, weight decreasing for 2 kg in last 2 weeks, pyrosis, itching, contractions during 30-25 sec. after 2-4 minutes. No anamnesis of acute viral hepatitis and chronic viral hepatitis B. HBsAg discovered in first time during current pregnancy. Told about chronic B hepatitis in mother.

12.11.2016 independent premature delivery. Male, 1880 gr., Apgar scale 7/7 pts.

In blood biochemical analysis 12.11.2016: total protein 65,3 g/L, albumin – 32,6 g/L, bilirubin – 118 umol/L, urea – 2,6 mmol/L, creatinine – 62,8 umol/L, ALT – 360 U/L, AST – 390 U/L.

Condition is heavy. Bright concision. Skin pale with excoriations. Treatment with heptal 400,0 IV, enterosorbents, desintoxication 800 ml/day.

18.11.16 abdomen US and MRI: diffuse changes of liver (fatty hepatosis), chronic cholecystitis.

In dynamics after 3 days worsening of analysis: bilirubin – 213,0 umol/L, ALT – 1535 U/L, AST – 2848 U/L, ALP – 256 g/L, PTI – 54%. After infectionist's consultation transferred into infectious disease department with diagnosis: independent premature delivery on 31st week. Heavy preeclampsia. Signs of intrauterine fetal hypoxia. Liver lesion. Chronic B hepatitis.

State on transfer moment is severe.

In ELISA 21.11.16: HBsAg – pos., anti-HBcAg – neg., HBeAg - neg., anti-HDV – neg., anti-HCV – neg., PCR HBV-DNA <750 copy/ml, HCV-RNA – neg., ELISA 24.11.16 – anti-HAV IgM - neg., anti-HAV IgG – pos. PCR 29.11.16 – HDV RNA – pos., HBV DNA <750 copy/ml.

Clinical diagnosis: Acute HDV-infection on background of chronic HBV-infection, jaundice form, medium severity. Chronic cholecystitis in remission. Chronic pyelonephritis.

After medication discharged on 20 day with satisfying state. Recommended: outpatient state monitoring and HDV antiviral therapy. Baby vaccinated by individual scheme and now on artificial feeding. Now HBsAG-negative.

CONCLUSION

Republic of Sakha (Yakutia) is the region with threatening situation in

chronic HBV and HDV morbidity.

This case demonstrates adverse pregnancy due to acute HDV-infection on the chronic HBV-infection background. Pregnancy finished by premature delivery. Considering epidemiological situation, we have to study all pregnant women to HBV and HDV infections, also all women with HBV infection to anti-HDV, be threatened during pregnancy and prevent bleeding, vaccinate child by specific immunoglobulin and proceed antiviral therapy if necessary.

Continuity in work of infectionists, obstetrics, and pediatricians is most important. Advanced measures in hemocontact viral hepatitis is necessary – revaccination in risk groups with postvaccian screening, perinatal prophylaxis, development of epidemiologic observation additional measures and special programs of treatment and prevention.

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RESULTS OF PHARMACEUTICAL EXAMINATION OF PRESCRIPTIONS

ABSTRACT

The study of results of pharmaceutical expertise was done in order to characterize the mistakes made while writing out prescriptions for medications.

Typical mistakes in the prescription were identified. Errors are organized by types of prescription forms and violations. A sociological survey conducted among physicians, revealed a number of factors that affect the proper execution of recipes. In order to reduce the number of wrong prescription, the model of an uninterrupted drug supply in the form of information system, encompassing the necessary measures to prevent mistakes in the appointment and prescribing drugs, was suggested. The proposed model will be helpful to minimize mistakes made while writing out prescriptions, as well as conflicts with visitors of the pharmacy and the organization of routing and uninterrupted supply of medicines.

Keywords: drugs, prescription forms, pharmaceutical expertise, mistakes.

INTRODUCTION

The prescription serves as the basis for the leave of medicines from pharmacies.

Federal Law No. 61-FZ, dated April 12, 2010, «On the circulation of medicinal products» defines: prescription for a medicinal product - a written prescription of a medicinal product in a prescribed form issued by a medical or veterinary worker entitled to do so for the purpose of dispensing a medicinal product or its manufacture and leave. [3]

The correctness of the formulation of the prescription is, first of all, a reflection of the professional culture and the level of professional competence of the doctor. Wrongly prescribed prescriptions of the doctor cause difficulties in the work of pharmacists, provoke conflicts with visitors, form a negative image of health workers and ultimately adversely affect the quality of drug provision for the population. [1]

The main documents regulating the technology of pharmaceutical prescription examination are the orders of the Ministry of Health of the Russian Federation.

Proper prescribing and prescribing of medicines by doctors is one of the necessary conditions in the organization of a system for the uninterrupted supply of medicines.

The problem of errors in prescriptions is relevant for different countries in the world. [2]

Analysis of available literature showed that no studies were conducted in the Republic of Sakha (Yakutia) on the results of pharmaceutical examination of prescriptions for medicinal preparations.

All of the above has predetermined the relevance of the research topic, the formulation of goals and objectives.

The purpose of the study: the systematization of typical errors

in prescribed prescriptions, the determination of factors affecting the quality of prescribing drugs, the development of trouble-free prescription drug provision.

MATERIALS AND METHODS

By the method of pharmaceutical examination the study of violations of the rules for prescribing and prescribing prescriptions for medicinal products was carried out on the basis of a pharmacy of ready-made medicinal forms, licensed to carry out activities related to the circulation of narcotic drugs, psychotropic substances (hereinafter NS and PW), and two health organizations in Yakutsk. In the course of the research, prescription forms of the forms 107 / y-NP, 148-1 / y-88, 148-1 / y -04 (n), 107-1 / y, logs of transactions related to the turnover of the National Assembly and the Supreme Council the release of the National Assembly and the Parliament for 2016 -17 years, the data of questionnaires of medical workers entitled to issue NS and PI, statistical data, normative acts were used.

RESULTS AND DISCUSSION

A pharmaceutical examination was carried out on 80 prescription forms that were received by the pharmacy organization in March 2017. 29 (36.25%) of these recipes were written out with errors and inaccuracies.

The revealed violations are systematized according to the type of errors and types of prescription forms.

1) Duration of prescription - 5 cases of receipt of prescriptions with expired validity have been registered. Of these, 3 cases per prescription blank 107 - 1 / y (simple form) and 2 cases at 148-1 / y-88 (for drugs subject to quantitative accounting);

2) Lack of precise dosage - 5 cases of incorrect dosing were recorded. Of these,

2 cases per 107-1 / y, 2 cases at 148-1 / y-88, 1 at 148-1 / y-04 (I) (forms of free leave).

3) The code of the category of citizens is incorrectly indicated in 4 cases on the prescription form 148-1 / y-04 (n) (form of free leave).

4) The stamp LPU - in 2 cases on the special prescription form 107 / y-НП (prescription form for narcotic drugs) there was no stamp.

5) The number of holidays - the excess of the standard for a one-time leave without proper registration.

6) The name in Latin - on the prescription form 107-1 / y (simple form) the name of the drug was not indicated correctly.

7) Printing for recipes - in 2 cases on prescription letter 148-1 / y-04 (I) there was no printing for recipes.

8) «For Special Purpose» marking - in 2 cases on prescription form 148-1 / y-88 excessive amounts of cyclodol and phenobarbital were written out, without the mark «For special purpose».

It is established that the minimum number of errors is made when writing prescriptions for narcotic drugs. But, it should be noted that narcotic drugs, as a rule, are issued to persons entitled to free medication. Therefore, prescription form 107 / y-НП is supplemented with prescription forms 148-1 / y-04 (n) and 148-1 / y-06 (n). For improperly prescribed medicines, no release or sale of medicinal products is made, which causes the loss of part of the treatment time in patients, as well as their conflict with medical and pharmaceutical workers.

35 doctors who have the right to prescribe NA and PI were questioned. A questionnaire consisting of 10 questions was developed for the study. The first part of the questions dealt with the

description of the nature of the work and the frequency of writing prescriptions for NA and PI. The second part of the questions of the questionnaire made it possible to reveal the degree of influence of the recent changes in the legislative framework regulating the procedure for assigning and issuing NA and PI. The third part of the questions is aimed at formulating proposals for the organization of error-free appointment and discharge of NA and PI.

35 doctors-part therapists were surveyed, among them 91% were women, 9% were men. Work experience from 1-5 years - 36% respondents, from 5-10 years 36% respondents, over 20 years- 28% respondents. 28% of doctors with the highest category, 16% with 2 category, 18% with 1 category, the rest without category. On average, everyone takes between 30 and 45 patients a day. All respondents have the right to appoint and write out NA and PI.

According to the results of the questionnaire, it turned out that doctors with experience less than 10 years write prescriptions for NA and PI 1-2 times a week, and doctors with experience of more than 10-20 years of experience write 4-6 recipes per week. All respondents noted that additional working hours are not provided for prescribing and prescribing NA and PI, because of the lack of a common information network with an attached pharmacy, it is not possible to know the presence and dosages of NA and PI in the pharmacy, especially the medicinal forms in the form of transdermal systems.

55% of respondents believe that due to changes in the regulatory framework, the requirements for writing prescriptions for NA and PIs became simpler, which significantly simplified the procedure for

appointing and issuing NS and PI, but 45% of respondents indicated that this did not affect their work in any way.

Sociological studies, as well as the results of a pharmaceutical examination, have shown that three factors influence the quality of prescription forms in accordance with the current regulatory documents:

- inadequate level of knowledge of regulatory legal acts regulating the rules for prescribing and prescribing medicinal products;
- the lack of a regulated time for the procedure of writing out and processing of prescription forms on NS and PI;
- the lack of an information program between outpatient and outpatient institutions and a pharmacy serving according to the prescriptions of these organizations.

For the uninterrupted supply of medicines, including NA and PI, it is necessary to introduce an information system between outpatient clinics and a pharmacy that serves the prescriptions of these organizations. The information system should contain software that allows doctors to have access to the assortment and the remainder of the pharmacy, which will significantly reduce the time of prescription writing. A doctor should have a program with the description of standards of treatment, pharmacotherapy, algorithms for assessing the risk when prescribing medications, possible side effects.

In addition, the system must generate electronic prescriptions, which excludes counterfeit prescriptions, as well as common mistakes.

CONCLUSION

As a result of the study, mistakes in prescribing and prescribing doctors

are classified according to the types of violations and forms of prescription forms. Most often doctors make mistakes when indicating the name, dosage, quantity of medicinal product, the code of the category of citizens and the source of financing. The percentage of improperly prescribed prescriptions for the study period was 36.2%. The most effective measure to prevent errors in prescribing and prescribing prescriptions is the introduction of an information system between the polyclinic and the attached pharmacy. The information system should cover all necessary measures aimed at preventing mistakes in prescribing, prescribing medicines and creating a system of uninterrupted provision of the population with medicines.

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O. N. Ivanova

TREATMENT OF ACUTE URTICARIA IN CHILDRENTĚY

ABSTRACT

The article is devoted to the urgent problem of acute urticaria (AU) in children. The analysis of the etiological factors of its formation is carried out. It was revealed that more often children with AU are sensitive to food allergens, in second place - to household allergens. The analysis of sensitization to food allergens revealed the highest percentage of sensitization to citrus. Very high sensitization is to the protein of cow's milk. When studying the effectiveness of antihistamines, it was found that the application of the erius preparation is the most optimal.

Keywords: allergology, allergens, sensitization, factors, urticaria rash.

INTRODUCTION

For many years urticaria is one of the important but least studied problems in pediatric allergology. The disease is in the interests of doctors of various specialties: pediatricians, immunologists-allergists, dermatologists, infectious disease specialists.

At present, urticaria is a heterogeneous group of diseases characterized by formation of blisters (surface elements raised above the level of the skin and disappears in about 24 hours) and/or angioedema (swelling of the deeper layers of the skin and mucous membranes) [1- 3].

The prevalence of urticaria has been insufficiently studied. According to the literature, 15 to 25% of the total human population is suffering from urticaria [1- 3]. In this case chronic urticarial is registered in almost 30% of all cases of urticaria. According to the reports, in the general population it is 0.05-0.5%, and among children and adolescents - 2.1 to 6.7%.

The relevance of the study of urticaria for pediatrics is determined by the following factors:

1. The prevalence of the disease in children and adolescents.
2. Polyetiological disease - to determine the cause it requires complex clinical, laboratory and instrumental methods of examination.
3. Acute urticaria occurs more frequently than chronic.

The purpose of the study: to study the etiological factors of the formation and treatment of acute urticaria in children 1 to 14 years.

MATERIAL AND METHODS

On the basis of allergological study in RB No. 1- NCM 69 children with chronic urticaria, aged 1 to 14 years were surveyed. Examination of patients was conducted according to the standards of diagnosis of allergic diseases and included a general clinical examination and specific allergy tests.

We conducted allergen testing to

value all children of the studied group with prick-tests to standard pollen allergens (early-flowering birch, alder, hazel, late-flowering -poplar, weed grasses - timofeevka, meadow grass, fire, sagebrush, reyras, dandelion, wheat grass) cereals (rye, oat, fescue). The severity of the skin reactions were evaluated +, ++, --. Comparison of averages will be conducted one-factorial dispersive analysis using T-student criterion to assess the equality of average F-Fisher criterion to assess the equality of variance. The relationship between parameters was assessed using the coefficients of the linear and rank correlation.

THE RESULTS AND DISCUSSION

We studied 69 children aged from 1 year to 14 years. What is revealed in examined children the highest frequency of manifestations of urticaria in the age group of 7-10 years. That was 28%. In the age group of 4-6 years the incidence of manifestations of urticaria was 18%. Next, we carried out the etiological factors of the formation of acute urticaria in children of the examined groups.

When you run scratch tests for skin testing with allergens positive results were obtained in 57 (82,6%) of the 69 children examined. At the allergological examination, sensitization to domestic allergens was diagnosed in 84.2% of children, to pollen allergens from 59.6% of children to epidermal allergens have 54.3% of children to food allergens in 94.6% of children.

Thus, the study showed that the most number of children has sensitization to food allergens, then - sensitization to household allergens.

At analyzing sensitization to food allergens it is revealed that the highest percentage of sensitization to (37,7%) is to citrus (table). This group of patients is not recommended to use mandarin, orange, lemon, grapefruit. Very high sensitization is to the protein of cow's milk of 30.4%. These children are not recommended to use such dairy products

as cheese, yogurt, milk, cheese, and cow meat. To prevent this allergy definitely breastfeeding in infancy is needed. In case of impossibility of breastfeeding mixtures with split protein casein (hypoallergenic, Nutrilon, nestožen, similac it.d.) are recommended. In children allergic to cow's milk and allergic to whey protein in milk is recommended the introduction of therapeutic mixture, where the split casein and whey proteins (alpha - and beta-lactoglobuline). An example of such a mixture is Frisopep AC and Alfare.

According to Russian figures, sensitization to cow's milk occurs in 75% of children with food allergies [1-3].

From 18.8% of observed children sensitization to fish allergens is noted. Patients with such allergies are not recommended to eat different types of fish.

Children with allergy to chicken meat made 13%. These children are not recommended to eat chicken meat and egg and products containing them, the baking, confectionery cream. Allergic to duck amounted to 8.7%. Allergy to birds is connected with allergy to bedding from feather and fluff.

In the treatment of acute urticaria it is necessary to prescribe antihistamines and enterosorbents. So, 10 patients

The frequency of sensitization to food allergens in children, according to the results of allergy testing

Food allergies	Number of children, %
Milk	30,4
Fish	18,8
Nuts	5,7
Peanut	2,9
Egg	11,6
Rye flour	5,8
Wheat flour	5,8
Duck	8,7
Chicken meat	13
Pork	1,4
Horsemeat	4,3
Citrus	37,7

received aerijs in a dose of 2.5 ml for 10 days, another group of patients (10 children) - The disappearance of clinical manifestations of acute urticaria in 90% of children who was treated with aerijs and 70% of children - with cetirine. Thus, in children with acute urticaria the preparation of aerijs is more effective.

CONCLUSIONS

1. In the distribution of children by age, sex and place of residence, more often acute urticaria occurs in the age group from 7 to 10 years (28%), in boys (55%) of the rural population (45%).

2. Among the etiological factors of acute urticarial are most common food

allergens - 94.6%, on citrus fruits - 37.7% and cow's milk protein - 30.4%.

3. In children with acute urticaria, the aerijs preparation is more effective than cetirine.

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EXPERIENCE OF USING THE INDACATEROL FROM THE POSITION OF CARDIOVASCULAR SAFETY

ABSTRACT

Clinical efficacy of inhalation therapy by Onbrez®Breezhaler® and examination of the effect on the leading clinical symptoms, quality of life (COPD Assessment Test), lung function, heart rate, QTc interval and the potassium level in blood in hospital patients with COPD were under study.

Based on the found evidence we can conclude that once daily administration of indacaterol at a dose of 150 mcg is an effective treatment for patients with COPD. It provides significant bronchodilation, reduces clinical manifestations, improves the quality of life of patients and has a favorable cardiovascular safety profile.

Keywords: COPD, treatment, indacaterol, Onbrez®Breezhaler®.

Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality worldwide. According to the results of modern epidemiological studies from 2 to 26% of the adult population suffer COPD in the European countries [6]. Prevalence and unfavorable course of COPD are associated with a high prevalence of tobacco smoking, unfavorable ecological situation, low medical literacy and other factors.

According to the World Health Organization COPD causes the death of more than 3 million people every year [20] and it is in the fourth place on the list of causes of death worldwide [14]. WHO expects that by 2030, chronic obstructive pulmonary disease will be the third leading cause of death [21].

According to numerous studies there is a clear correlation between the decrease in FEV1, cardiovascular morbidity and mortality [15,18,19]. The long-term population-based study indicated that the risk of cardiovascular mortality was more than double among patients with low forced expiratory volume in 1 second than in the group with higher levels of FEV1, at that, it was independent of

smoking status [19]. The epidemiology of arrhythmias in the patients with COPD and their connection with a fatal case was examined in the Copenhagen City Heart Study. It is ascertained that COPD is associated with a high incidence of heart rhythm disturbances [16]. It is important to note, the mortality rate of patients with the combination of severe acute COPD and arrhythmia is more than 30%, by comparison with the mortality rate of the same patients but without arrhythmias is 8% [9].

Many researchers demonstrate the high prevalence of different types of arrhythmias in patients with COPD [1-5]. The pathogenesis of arrhythmias in these patients is multifactorial: systemic inflammation, hypercapnia, and oxidative stress lead to the acceleration of atherogenesis and provoke arrhythmias, dysfunction of the left and right ventricles, hypoxia, respiratory acidosis, hypokalemia, hypomagnesemia, and dysfunction of cardiac conduction system. It is necessary to notice the high probability of pharmacological therapy induced arrhythmias with the high doses of bronchodilator drugs [7], the drugs of the 1st line of the majority of patients with

COPD.

The using of β_2 -agonists is accompanied by stimulation of the Na⁺/K⁺ and ATPase of skeletal muscle interfacing with β_2 -adrenoreceptor following elution of muscle fibers Na⁺ and intracellular accumulation of K⁺ increasing, but decrease of concentration of K⁺ in blood [17].

Therefore, an effective and safe treatment of this pathology is one of the priority tasks of modern pulmonology.

The dimension of pharmacological treatment is based on clinical symptoms, post-bronchodilator forced expiratory volume in 1 s (FEV1) and frequency of exacerbations of the disease. It should be noted that patient compliance and adherence to the recommended regimens of medical maintenance are important components of effective treatment. From this point of view, the facilitation of medical treatment regimens and once daily administration are steps towards that.

The big gain of the modern pharmacology is the design of long action β_2 -agonist (Indacaterol). Virtually all β_2 -agonists are a mixture of R- and S-enantiomers, the inactive S-enantiomer

is interfaced with adverse proinflammatory reactions in preclinical models. Indacaterol is specifically developed as a single enantiomer to out the adverse proinflammatory reactions. It includes the active R-enantiomer. The inactive isoform (S-enantiomer) is eliminated by chemical synthesis. Onbrez®Breezhaler® is a medicinal product with established a good reputation among the patients with COPD. It has a 24-h bronchodilator effect and is characterized by a fast start of action (within 5 min.) and a good tolerability [8,10-13].

The goal of research consists in clinical efficacy evaluation and examination of the effect of inhalation therapy of Onbrez®Breezhaler® to the leading clinical symptoms, quality of life (COPD Assessment Test), lung function, heart rate, QT interval and the potassium level in blood in hospital patients with COPD.

MATERIALS AND METHODS

The research is based on the follow-up of 53 patients with COPD having hospital treatment at the state-financed health institution of the Novosibirsk Region municipal clinical hospital №25 in the city Novosibirsk. All patients had COPD as a diagnosis. It was verified in accordance with the typical clinical course and lung function (symptoms of obstructive or mixed bronchial airway obstruction and post-bronchodilator forced expiratory volume in 1 s (FEV1) to forced vital capacity (FVC) less than 70% of predicted values). In accordance with GOLD classification on data set the degree of bronchial airway obstruction, number of exacerbations per year and the severity of clinical symptoms subsequent to the results of mMRC and COPD Assessment Test (CAT) patients were assigned to group B. The duration of the disease varied from a few months to 20 years. The entire group of patients did not have clinical, anamnestic, electrocardiographic, radiographic symptoms of bronchial asthma, unstable angina, postinfarction cardiosclerosis, congestive cardiac failure, congenital heart diseases, various forms of cardiac arrhythmias, myocarditis, pericarditis, cardiomyopathy, renal and hepatic failure. There were 35 men (66%) from 43 to 65 years at the mean age of $57 \pm 1,9$ years old. And there were 18 women (34%) from 48 to 55 years at the mean age of $51 \pm 1,5$ years old. They were prescribed the standard treatment focused on the suppression of the inflammatory response and augmentation of the patency of bronchi. The treatment was the broncholytic therapy (150 mg of Indacaterol per day), also mucolytic and

antibacterial therapy (third generation cephalosporins). The patients did not take any medications to reduce heart rate. The leading clinical symptoms, quality of life (COPD Assessment Test), lung function, heart rate, QT interval and the potassium level in blood as the risk factors of fatal arrhythmia were measured initially and in 10 days after the treatment.

The statistical analysis was performed using the program Statistica V.6.0.

RESULTS AND DISCUSSION

The heart rate analysis showed the results presented in Figure 1. At primary inspection 29 patients (55%) were recorded with sinus tachycardia, heart rate up to $115,7 \pm 10,1$ beats per minute ($p < 0.05$) accompanied by hand tremor in 7 patients (13%).

At the 3rd day of treatment the heart rate decreased to $91,6 \pm 10,5$ beats per minute. There were no complaints of hand tremor. At the 5th day of treatment heart rate was $84,0 \pm 3,5$ beats per minute. At the 10th day the heart rate was $68,1 \pm 8,4$ beats per minute.

At the 10th day of the treatment there was no clinically significant increase of QT interval.

Hypokalemia was revealed at the moment of admission in 8 cases (15%). At the 10th day there was no reducing of the concentration of potassium in the blood.

There was a decrease of FEV1 as related to the initial measure at an average of 140 ml at the 5th and 170 ml at the 10th day of attendance.

Figure 2 shows the decrease in the total score of clinical symptoms of COPD (according to COPD Assessment Test) by 40% among men and 47% among women, this corresponded to a moderate impact on the lives of COPD patients (Fig. 1).

CONCLUSION

Based on the evidence found we can conclude once daily administration of Indacaterol at a dose of 150 mcg is an effective treatment for patients with COPD. It provides significant bronchodilation, reduces clinical manifestations, improves the quality of life of patients and has a favorable cardiovascular safety profile.

The positive results can be explained by the structural features of the Indacaterol molecule.

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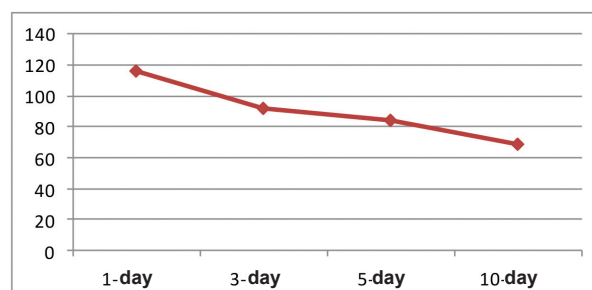


Figure 1. Heart rate dynamics under Indacaterol therapy

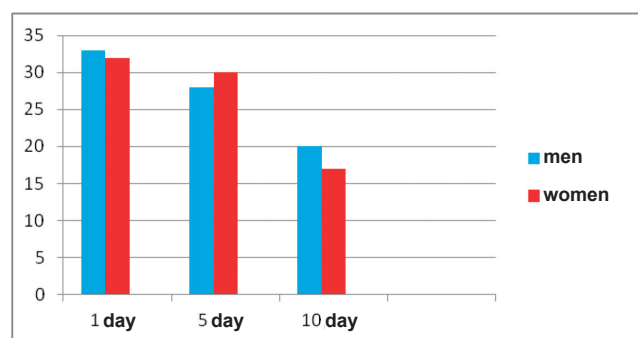


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EXPERIENCE OF NON-MEDICAMENTOUS CORRECTION OF CALCIUM-PHOSPHORIC EXCHANGE DISORDER IN A PATIENT WITH COMORBID PATHOLOGY

ABSTRACT

We have used for the first time a non-medicamentous complex method of correction of fish-bone flour and mineral water «Abalakhskaya» with disorder of calcium-phosphorus metabolism in a patient with comorbid pathology.

Objective: to study calcium-phosphorus metabolism in a patient with osteoporosis, pathology of the biliary tract through complex non-drug correction with the use of food fish-bone flour and mineral water «Abalakhskaya».

The clinical study included two times complex application of mineral water «Abalakhskaya» in a volume of 400-600 ml / day and food fish meal 18 g / day daily for 45 days with two 1.5-month breaks. The duration of the course of treatment was 6 months.

After the course of complex reception of food fish-bone flour and mineral water «Abalakhskaya», the patient notes decrease in pain in the lumbar spine, increase in physical activity, decrease in weight by 5 kg, improvement in the condition of nails and hair, and normalization of the stool. According to the patient, overall well-being has improved.

At physical examination of the patient we revealed:

- a decrease in BMI from 36 to 33.8 kg / m², which corresponds to the obesity of grade 1;
- Significant reduction in palpable tenderness of the lumbar region the spine;
- nail plates with a flat surface, pale pink color, fragile.

The patient underwent two stages of the complex non-medicamentous correction well, no side effects were noted.

Keywords: comorbid diseases, non-pharmacological technologies, calcium-phosphorus metabolism, fish-bone flour, mineral water «Abalakhskaya».

INTRODUCTION

The high rate of the population of Yakutia with socially significant diseases of digestive organs, osteoporosis, arterial hypertension dictates the need to develop new rational methods of prevention and treatment, including using biomedical technologies.

The transition to a strategy for the development of health saving technologies, including the rational use of environmentally friendly biological natural resources available on the territory of the Republic of Sakha (Yakutia), will allow the introduction of non-medical technologies of non-drug technologies into the practices of prevention and treatment of diseases.

Objective: to study calcium-phosphorus metabolism in a patient with osteoporosis, pathology of the biliary tract through complex non-drug correction with the use of food fish-bone flour and mineral water «Abalakhskaya».

MATERIALS AND METHODS OF RESEARCH

The research was carried out from March 13, 2017 to August 31, 2017 by the educational and scientific laboratory (UNIL) «Medical technologies in gastroenterology» of the department «Hospital Therapy, Occupational Diseases and Clinical Pharmacology» of the Medical Institute North-Eastern

Federal University named after M.K. Ammosov, the small Innovative enterprise LLC «Dary Yakutia» and LLC «Abalakhskaya medicinal water», the Institution of the Ministry of Health Care of the Republic of Sakha (Yakutia) «Abalakh Republican Center for Medical Rehabilitation». The study was approved at a meeting of the local bioethics committee of «North-Eastern Federal University named after M.K. Ammosov» (Minutes No. 9 of 15 February 2017, Decision No. 1).

Fish-bone flour, rich in macro- and microelements, in particular calcium and phosphorus, omega-3, omega-6 polyunsaturated fatty acids, proteins, fat and water-soluble vitamins, can be used as a means to regulate the of calcium phosphorus homeostasis.

The production of fish-bone flour with the help of the radiation-convective method of drying bones with the remains of fillets on the bones which allows the maximum preservation of useful

substances. For this technology of food fishmeal flour production, patents of the Russian Federation in 2014 and international Eurasian in 2017 have been obtained (Authors: Safonova S.L., Borisov V.E., Borisov E.E.).

Mineral water «Abalakhskaya» is low-mineralized hydrocarbonate sodium water with a slightly alkaline reaction. 4 new patents of the Russian Federation for inventions in 2010 and 2013 (Authors: Safonova SL, Emelyanova EA, Platonova AA) were obtained for new technologies for treating gastroenterological patients using the mineral water «Abalakhskaya».

The clinical study included two times complex application of mineral water «Abalakhskaya» (AMV) in a volume of 400-600 ml / day and food fish meal 18 g / day daily for 45 days with two 1.5-month breaks. The duration of the course of treatment was 6 months (Fig. 1).

The patient was selected on a voluntary basis on the basis of inclusion and exclusion criteria.

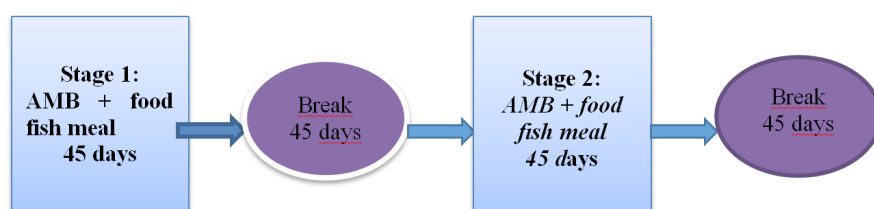


Fig.1. Scheme of complex application of AMB and fish-bone flour

At the stage of research the paraclinical methods of diagnostics are monitored:

1. Indicators of calcium and phosphorus metabolism in the patient's body:

- levels of ionized calcium in blood and urine, phosphorus in the blood, 25 (OH) D (cholecalciferol), alkaline phosphatase, lipid spectrum of blood, protein composition of blood;

- general clinical tests of blood and urine;

- X-ray densitometry was performed on GE Lunar iDXA, in 3 standard projections (lumbar spine, femoral neck, forearm radius). Since there was a fracture of the radius in a typical place of the left forearm, a bone mineral density (BMD) study was carried out on the right forearm. To interpret the results, the densitometric classification of WHO (1994) was used in estimating BMD in postmenopausal women. The results of densitometry were evaluated as: «normal» at a T-test value of +2.5 SD to -0.9 SD from peak bone mass; «Osteopenia» with a value of the T-test from -1.0 SD to -2.4 SD; «Osteoporosis» with a T-test value of -2.5 and less SD. By «severe osteoporosis» was meant the value of the T-test was -2.5 SD and lower with the presence of one or more fractures in the anamnesis.

In order to interpret the results, the WHO densitometric classification (1994) was used in the evaluation of BMD in postmenopausal women, according to which the diagnosis of osteoporosis is carried out on the basis of the T-test: within the norm there are values not exceeding +2.5 SD (standard deviation) and not below -1.0 SD, values from -1.0 SD to -2.5 SD are considered as osteopenia, values below -2.5 SD are classified as osteoporosis and values of -2.5 SD in the presence of at least one fracture of the vertebra or femoral neck, as well as other fractures that do not correspond to severity of trauma - as severe osteoporosis.

Comparison with the norm was carried out in two respects: comparison with the normal peak bone mass (T-test), that is, with an average value for the age at which the BMD in this part of the skeleton reaches a maximum and comparison with the age norm (Z-test) that is, with an average value for a given age. The result of the comparison is represented in SD and in percentage to the corresponding norm.

2. Electrocardiography (ECG) in 12 conventional leads, office measurements of blood pressure;

3. Ultrasound examination (ultrasound) of the abdominal cavity organs;

4. Esophagogastroduodenoscopy (EFGDS)

RESULTS AND DISCUSSION

Patient A., 64 years old, a working pensioner, lives in Yakutsk. Complaints of pain in the lumbar spine when getting prolonged static load, pain while moving in the right shoulder, bitterness in the mouth, bloating, pain in the right upper quadrant, unstable stools when taking fatty, fried foods. The patient is included into the first of dispensary account on chronic acalculous cholecystitis, a focal-atrophic gastritis a specific diet is recommended. According to her words in 2009 she suffered a fracture of the radius in a typical place on the left, in 2010 she underwent 2 operations for a complex fracture of the right shoulder, resulting from a domestic trauma. Treatment with calcium and bisphosphonates was not carried out.

Obstetric and gynecological history: 6 pregnancies, 6 urgent deliveries, physiological menopause at the age of 53 years.

The allergic anamnesis is not burdened.

The condition is satisfactory. Consciousness is clear. Body mass index (BMI) 36 kg / m². Correct physique, hypersthenic constitution, increased nutrition. The gait is not impaired. Bone-joint system: limitation of mobility in the right shoulder joint, postoperative scar. The left forearm without deformity. There is pain in palpation of the lumbar spine, fragility of nail plates. Skin covers and visible mucous membranes are pale pink, moist. Peripheral lymph nodes are not enlarged. Visible edema is not present. Frequency of respiratory movements is 20 per min. Voice tremor is weakened. Percutally clear pulmonary sound. With auscultation, breathing is vesicular, there is no wheezing. The apical impulse is not determined. The border of the heart is not expanded. The heart sounds are weakened, the rhythmic heart rate is 72 per minute, the pulse on the radial artery is symmetrical, the rhythmic 72 per minute. Arterial pressure (BP) 130/80 mm Hg on both hands. The tongue is moist, covered at the root with white coating. The abdomen is enlarged in volume due to subcutaneous fat, symmetrical, participates in the act of breathing. With superficial palpation the abdomen is soft, painless. Symptoms of Murphy, Ortner are negative. The liver and spleen are not enlarged with percussion. The symptom of effleurage is negative. According to the patient, the stool is regular, chaped by, without pathological impurities. Urination is free, painless. Initial laboratory indicators. The general or common analysis of a blood as of 15.03.2017 without a pathology. The general analysis of urine as of March

15, 2017 without pathology.

Biochemical blood test as of March 15, 2017 total cholesterol 6.11 mmol / l, ionized calcium 1.2 mmol / l, phosphorus 1.03 mmol / l, vitamin 25 (OH) D 23 ng / ml.

Initial results of instrumental research.

Ultrasound of the abdominal cavity of 10.03.2017 - signs of chronic acalculous cholecystitis.

EFGDS from 11.03.2017 - functional failure of cardia. Focal-atrophic gastritis in remission.

ECG in 12 conventional leads from 11.03.2017 sinus rhythm 70 in min. The electric axis is horizontal.

X-ray densitometry dated 03/09/2017.

Mineral density of the bone tissue of the lumbar spine in segment L1-L4 (0.984 g / cm²), T-criterion -1.7 SD, 83% of peak bone mass, Z-criterion -1.2 SD corresponds to osteopenia. The bone mineral density in the femoral neck region to the left is (0.785 g / cm²), the T criterion is -1.8 SD, 76% of the peak bone mass, the Z-criterion -1.1 SD corresponds to osteopenia. The mineral density of bone tissue is 33% of the radius of the right forearm (0.546 g / cm²), the T criterion is -3.8 SD, 62% of the peak bone mass, the Z criterion -2.5 SD corresponds to osteoporosis.

The risk of major osteoporotic fractures over the next 10 years under the FRAX program is 28.7%, the risk of hip fracture is 1.7%.

Taking into account the complaints of the patient, the history of the disease, the indicators of clinical-laboratory, instrumental-diagnostic studies, the following diagnosis is made: for the first time revealed postmenopausal osteoporosis, a severe form with a fracture of the radius of the left forearm.

Focal-atrophic gastritis in remission. Chronic calculus-free cholecystitis without exacerbation. Hypercholesterolemia. Obesity of the II degree.

In order to correct the violation of calcium-phosphorus metabolism, the patient is assigned the following:

1. A complex of rehabilitation measures with the implementation of an educational school for the correction of excess weight, a program of physical activation.

2. Table 5 on Pevzner;

3. Fish-bone flour for 9 g 2 times a day during lunch and dinner for 45 days;

4. Mineral water «Abalakhskaya» t 42 ° C to 200 ml 3 times a day for 1- 1.5 hours before meals for 45 days. Intake of water in large sips is recommended.

After the course of complex reception of food fish-bone flour and mineral water «Abalakhskaya», the patient notes decrease in pain in the lumbar spine,



Fig. 2. Dynamics of levels of vitamin 25 (OH) D and total cholesterol in patient A., 64 yrs.

increase in physical activity, decrease in weight by 5 kg, improvement in the condition of nails and hair, and normalization of the stool. According to the patient, overall well-being has improved.

At physical examination of the patient the following is noted:

- a decrease in BMI from 36 to 33.8 kg / m², which corresponds to the obesity of grade 1;

- Significant reduction in palpable tenderness of the lumbar region the spine;

- nail plates with a flat surface, pale pink color, fragile. The patient transferred two stages of the complex non-medicamentous correction well, no side effects were noted.

In biochemical analysis, the following is recorded: - normalization of the total cholesterol level from 6.1 to 5.0 mmol / l (Fig. 2); - restoration to an adequate level of vitamin 25 (OH) D from 23 to 31 ng / ml (Fig. 2); - the concentration of ionized calcium and phosphorus in the blood serum within the limits of normal values (Fig. 3).

Daily urinary calcium excretion is within normal reference values, but after the 2-nd stage of the complex reception of fish- bone flour and mineral water «Abalakhskaya» with a daily diuresis of 2500 ml, the calcium level is reduced to 1.30 mmol/ day, which can be explained by improvement in metabolism between the bone tissue and blood with mobilization of calcium and phosphorus (Fig. 4).

X-ray densitometry dated 18.09.2017

The mineral density of the lumbar spine bone in segment L1-L4 (1.018 g / cm²), T-criterion -1.4 SD, 85% of peak bone mass, Z-criterion -0.9 SD corresponds to osteopenia. The bone mineral density in the femoral neck region on the left (0.816

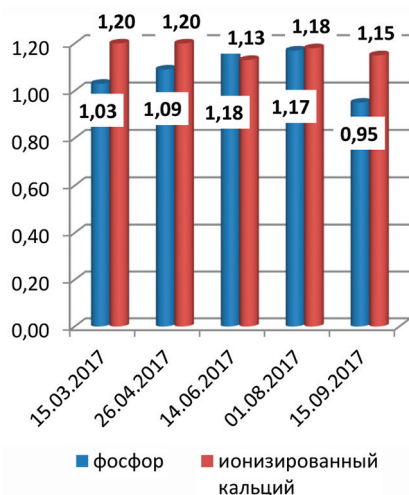


Fig. 3. Dynamics of the level of ionized calcium and phosphorus in the blood in patient A., 64 yrs.

g / cm²), the T criterion -1.6 SD, 79% of the peak bone mass, the Z criterion -0.8 SD corresponds to osteopenia. The mineral density of the bone tissue, 33% of the radius of the right arm of the right arm is (0.547 g / cm²), the T criterion is -3.8 SD, 62% of the peak bone mass, the Z-criterion -2.4 SD corresponds to osteoporosis.

The risk of major osteoporotic fractures over the next 10 years under the FRAX program is 26.4%, the risk of fracture of the femoral neck is 1.4%.

The conclusion. Based on the results of X-ray densitometry after six months of observation, the bone mineral density in the segment L1-L4 was increased by 0.034 g/cm and the neck of the left femur was 0.031 g/cm (Fig. 5), the positive dynamics in the mineralization of the radius of the right forearm was observed.

Also there was a decrease in the risk of 10-year probability of fractures against the background of osteoporosis.

The incremental mineralization of bone tissue in the axial skeleton is due to the fact that initially at the time of the initial examination in these segments, BMD corresponded to osteopenia. In the peripheral skeleton with pronounced signs of osteoporosis, there is no significant increase in mineralization of bone tissue. Thus, observing the increment of mineralization of bone tissue of the axial skeleton against the background of complex application of fish-bone flour and mineral water «Abalakhskaya», in patient A., 64 yrs., it is recommended to continue treatment with the addition of

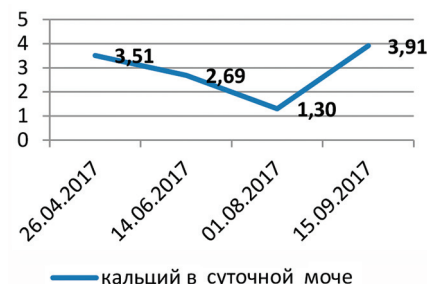


Fig. 4. Dynamics of daily excretion of calcium in urine in patient A., 64 yrs.

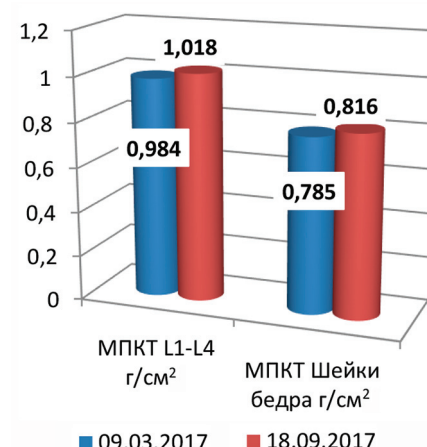


Fig.5. Dynamics of growth of BMD in the axial skeleton in patient A., 64 yrs.

pathogenetic therapy.

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