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ABSTRACTS BOOKS

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CHILDREN'S CEREBRAL PALSY: PRIMARY PROPHYLAXIS

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The term Children's Cerebral Palsy (CCP), presently, does not designate any certain disease, it unites children having not progressing infringements of arbitrary movements (spasticity, ataxia, hyperkinesias). Union of children with such infringements in one group with name CCP helps to concentrate forces and opportunities on treatment and formation of impellent skills for the greatest possible rehabilitation. But such union complicates the search of prophylactic actions, early diagnostics and treatment of child's disease at the initial stage (in the acute period).

Modern medicine distinguishes great number of CCP reasons. On the first place there is brain lesion during the period of intra-uterine development of fetus, caused by more than 400 factors, including acute and chronic diseases of mother, harmful habits of parents, psychological discomfort, infectious agents, traumas and hypoxia.

Nowadays the number of birth trauma cases are 0,2–30%. In the structure of perinatal death rate intracranial birth trauma takes 10–12%. 97.5% from all cases of fatal birth trauma is taken by trauma of skull. In the structure of perinatal and early neonatal death rate reasons birth trauma's indicators are at 8,89% and 14,11% respectively.

Thus, increasing the amount of patients with CCP for the last time specifies that the amount of birth traumas has increased. It is directly connected with using of birth stimulation.

Hypoxia during the birth leads to damaging of capillaries' endothelium, to infringement of brain vessels' self-regulation; to increasing of brain blood-flow, to rising of venous pressure. All this causes damages of brain: hemorrhages, hypostasis, ischemia. Thus, the child, in result of artificial acceleration of the natural mechanism of childbirth, receives damages of a brain. After birth such children have: hemiparesis, tetroparesis, spastic and dystonia, hyperkinesias, ataxia, curvatures of trunk, limbs and face, hearing and vision disorder and hydrocephaly.

At present, for reduction of CCP sick-rate is necessary to pay special attention to the practice of obstetric aid.

It is necessary to enhance the responsibility of obstetrics for outcome of births and state of child.

It is necessary:

1) To recognize at an official level as the basic and main reason of CCP – birth trauma and hypoxia in childbirth occurring at stimulation of birth activity, contractions of uterus.

2) To forbid odynagogue on large scales, as dangerous to health of child.

3) Indications to induction (stimulation) of births should be accurately registered by the doctor – obstetrics. Stimulants for birth activity should be put on the strict registration.

4) It is necessary to expand indications to Cesarean section for avoidance of birth trauma and child's hypoxia at disturbed birth activity of the mother.

THE LINK BETWEEN A TYPE OF LABOR ACTIVITY AND CEREBRAL PALSY

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Certain physiological processes that are in a close union occur during labors: pains prepare the uterus, i.e. prepare the labors canal. The baby`s head is normally placed toward the labors canal and in a close (biophysical and biochemical) concord with mother gets ready to be born: The head matches the labors canal in size on the account of flexibility of the baby`s skull`s bone junction Baby`s nourishing with oxygen and nutrients takes place at the expense of the mother`s organism (through placenta and umbilical cord), therefore any acceleration of delivery may break the harmony of mother and child in their common birth process. As a result of artificial acceleration of the natural mechanism, traumas and hypoxia, the baby suffers brain injuries.

The term "children`s cerebral palsy" (CCP) designates the group of the brains motoric functions` impairments occurring as a consequence of it`s damage in childhood. These impairments are not progressive, that is, they appear since the child`s birth and exists throughout the whole life. After the birth at these children such symptoms as hemi- and tetroparesis, spasticity and dystonia hyperkinesis, ataxia, trunk, limbs and face curvatures, hearing as well as vision impairments and hydrocephalus. The aim of the research: to reveal the link between organic pathology of CNS and the type of labor activity. Materials and methods of research: ue committed a retrospective analysis of 714 case histories from archive materials of maternity hospitals and conducted statistical processing. All the data are divided into 2 groups: the first of group contains children who were born physiologically, the second group – those born by cesarean section.

Research results: After analyzing the case histories it was revealed that 14,1% of the whole number children made up those who were born by the use of cesarean section, the physiological parturitions constituted 85,9% respectively. Of that, girls made up 42,5% and 53,4% boys – 57,5% and 46,6%. The indications for surgeries were such diagnoses as pre-eclampsia (22,7%), invalidity of the scar narrow pelvis (11,8%), breech presentation

(9,9%), lackness of cervix (5,9%). The average age of women in labor was 30. The average indicator on APGAR scale at children who were born in a physiological way was 7 (±0,6), whereas children who were born by cesarean section had the average of 6 (±0,3). After the burther abservation the following indicators were brought to light: alongside the low score on APGAR scale only 1,3% of children born by cesarean section developed organic pathology of CNS, whereas among children born physiologically it was 9,7%.

Thus, it is necessary to widen the indications for cesarean section at pathological cases of pregnancy and at labor activity dysfunction at woman in labor in normal time. The indication for surgical intervention should be videned instead of complex turns of fetus, vacuum extractions, use of midde and high forceps during parturition and the indications for use of medications stimulating labor activity.

RECOMBINANT ALPHA–2–INTERFERON FOR IMMUNE REHABILITATION OF RECURRENT RESPIRATORY INFECTION INFANTS WITH CEREBRAL PALSY

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Significance. Recurrent respiratory infection (RRI) infants and infants with prenatal infection pose a fairly serious problem for optimization of comprehensive treatment of infants with cerebral palsy (CP). RRI is neither a clinical entity nor a diagnosis; it is a group of infants with frequent (4 and more) episodes of acute respiratory disease caused by transient corrective deviations in organism protective systems and with no stabile organic abnormalities in them.

Materials and Methods. CP infants of 0 to 3 years of age (18–36% of all treated children with CP in different years) were monitored in 2008–2010. Boys predominated in the sex composition. Post-infection resistance in CP infants decreased due to changes in homeostatic equilibrium of their immune systems. Various researchers (for example, N.A. Korovina et al., 2001) detected disorders in T-lymphocyte functional activity, changes in helper/suppressor ratio, defects in phagocytosis stages, disgammaglobulinemia, decrease in A globulin, lysozyme levels. These changes are interpreted as dependent on premorbid background (cerebral palsy, perinatal hypoxia).

Immunocorrection aimed at increasing immune resistance in an infant with CP consisted in a correct choice of an adequate preparation among immunotropic preparations used for different "damage levels" of the immune system: phagocytic, cellular, humoral. Recombinant alpha-2-interferon, which is a "Viferon" component, possesses antiviral, immunomodulatory, antiproliferative activity and increases activity of natural killers, T-helpers, cytotoxic T-lymphocyte and phagocytic activity.

All mentioned properties of interferon enable it to participate effectively in an agent elimination process, to prevent infection and possible complications. The preparation was prescribed in the form of suppositories "Viferon1". The treatment duration of 11 weeks was prescribed according to the scheme recommended by Professor Nesterova I.V. in the "RRI Infants Immune Rehabilitation Program". Viferon 1 treatment was started in

a ward: 1 suppository bis in die, daily during 3 weeks; then the treatment was continued in the outpatient setting according to the scheme.

Conclusions: During the monitoring period (2008 – 2010) the performed immune rehabilitation of RRI infants with Viferon aided to the decrease of ARVI morbidity from 11.2% to 8.8%, reduction of the number of RRI infants from 44% to 31%, lowering of ARVI duration from 8.76 to 6.6 days, reduction of a number of ARVI complications and thus it facilitated optimization of complex CP therapy.

ORTHOPEDIC STATUS OF CHILDREN WITH CEREBRAL PALSY (CP)

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According to existing concepts for today, cerebral palsy – a group of central motor disorders, in which the antenatal, perinatal and / or early neonatal periods of development is an acute and / or chronic exposure to the etiologic factor, leading to brain damage and subsequent disruption of predominantly motor sphere.

The goal was to identify and analyze the most characteristic change in the orthopedic status in children with moderate to severe cerebral palsy. In 2011, the number 7 ASKOSHI Rehabilitation received 56 children with various motor disorders due to central nervous system, among them – were a group of 33 foster child of preschool age.

Among all children in care, 54 children were observed with various forms of cerebral palsy. The most common form was spastic diplegia, with varying degrees of severity (from mild to severe) was diagnosed in 30 children. One child revealed spinal muscular atrophy type II, and one child with a congenital malformation of the brain. Most pupils have complex disorder of motor function, covering all components of the motor areas: the movement, hold sitting or standing position, the ability to voice communication. In conducting the orthopedic examination revealed that all children have primary or secondary disorders of orthopedic status. The most frequent (64.8%) – deformation of the foot, expressed mostly in the form of flatfoot valgus and various forms of flatfoot. Second place is occupied by the number of incorrect posture (61.1%), represented mainly by a significant increase in thoracic kyphosis in children with severe cerebral palsy and smoothed curves and physiological asymmetry in children with moderate. A significant number of pupils (57.4%) had joint contractures of the lower extremities, with a predominant localization in the proximal (flexion contractures of the hip-lead joints, flexion contractures of the knee). In 37% of the children revealed bilateral hip dysplasia, provided the change is most often valgus neck-shaft angle of the femur (coxa valga) and hypoplasia (skewness), the roof of the acetabulum. Most of the children revealed a combination of different types of spinal deformity and limb.

If conservative rehabilitation treatment of children with this disorder, we use an integrated approach with physiotherapy, adaptive physical education, Mechano, physiotherapy, as well as a mandatory method of postural orthosis (the use of tutorials, orthopedic shoes, wheelchairs corsets, verticalizer) and the method of dynamic proprioceptive correction (the use of costume Adelie Gravistata). This approach makes it possible to stop or slow the progression of deformation, as well as improve the quality of life for young patients.

These data confirm that in the rehabilitation treatment of children with disorders described an integrated approach with the obligatory participation of the doctor-orthopedist, who must make maximum use of the entire arsenal of available tools and accessories for the correction and prevention of progression of existing deformities.

SPA TREATMENT OF CHILDREN WITH CEREBRAL PALSY, AFTER VENTRICULO–PERITONEAL SHUNTING

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Children's Cerebral Palsy – multietiological disease that occurs during fetal development, childbirth and newborn. According to statistics from 6 to 10% of children with perinatal encephalopathy, get children's cerebral palsy (CCP). Particularly noteworthy are the patients whose condition is complicated by hypertensive-hydrocephalic syndrome with the presence of cerebrospinal fluid crises. In these cases an operative intervention is advised, in particular, the ventriculo-peritoneal shunting. With a favorable outcome of the operation it is possible to use rehabilitation medication and physical means further.

In the children's psycho-neurological department of Pyatigorsk clinik 18 children with cerebral palsy at the age of 1.5 to 3 years who had undergone ventriculoperitoneal shunting on the progressive hydrocephalus were treated. The children arrived to the department after 6 – 8 months after the surgery. They continued to receive dehydration therapy (Diakarb 2 times per week), mud applications were appointed on the paretic limb, temperature 38 – 39º C for 8 – 10 minutes, the course of 8–10 procedures, every second day, in combination with exercise therapy in «Adele» suits and massage. All the children had severe tetraparesis with the presence of primitive tonic reflexes, delayed psychoverbal development, pseudobulbar palsy.

Children significantly reduced the severity of the primitive tonic reflexes. Tonic neck-symmetric, asymmetric and the labyrinth reflexes got reduced in half of the patients from those where they originally occurred. The appearance of the adjusting reflexes allowed to keep his head in an upright position to 12 instead of 8 patients, to three to sit without any support, to sit with support to 15 instead of 6 patients. High muscle tone, decreased in 8 of 18 children by 40%, they have also reduced the height of tendon reflexes.

Reoencephalographic data showed an improvement of cerebral blood flow: an amplitude-pulse perfusion significantly increased, venous outflow improved, vascular resistance normalized during the early spread of the pulse wave. Echoscopic studies showed a decline in the index of pulsation from 50% to 30%. Assessing the dynamics of clinical and electrophysi-

ological parameters, we noted a significant improvement of 11.1%, an improvement of 66.7%, a slight improvement of 16.7% of children and 5.5% with no improvement.

The positive effect of treatment we associate above all with the appointment of mud treatments to the paretic limb that have a relaxing effect on spastic muscles, improve the trophic function and neuromuscular conduction. Medical gymnastics and massage potentiated the therapeutic effect. The results of treatment have shown feasibility and effectiveness of physical factors in the rehabilitation of patients with children's cerebral palsy complicated with hydrocephalus, after ventriculo-peritoneal shunting.

EARLY REHABILITATION OF THE PATIENTS WITH CEREBRAL STROKE

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A stroke often leaves a heavy consequences in the form of motor, visual, speech and mental disorders, causing a significant exclusion of patients in society. The problem of medical rehabilitation and social adaptation of patients becomes an important task of the government.

The aim: assessment of the effectiveness of early rehabilitation of the patients with cerebral stroke.

Material and methods. The outcomes of a treatment and rehabilitation measures in 250 patients with acute stroke at the age from 18 to 85 years of age were analysed. 42,8% women and 57,2% men were examined. The period from development of a stroke to the beginning of the rehabilitation was of 3.2±1.2 days. We worked with each of patients individually, having rehabilitation purposes and using the possibilities of a multidisciplinary team. The NIHSS, Rankin Scales, Bartel Index were applied to assess the effectiveness of interventions.

Results. Partial, in some cases full recovery of moving function in the proximal department of the limbs, fingers, improvement of walking were achieved in patients with motor deficit, late-tonic disorders, destroyed motility of fingers, the difficulty of verticalization and independent walking. The neurological severity of the stroke according to the NIHSS Scale was reduced from 12,3±2,9 on admission to 6,8±1,2 by the 21st day ($P<0,05$), the functional outcomes of the Rankin Scale was improved from 3.4±0,2 to 2,7±0,1 ($P<0,05$), Bartel Index was increased with 65±12 up to 80±7 by the 21st day as result of the undertaken measures. The existing cognitive dysfunction, disorders of speech and the presence of post-stroke depression made it difficult to carry out the rehabilitation and reduced its effectiveness.

Conclusions. Early rehabilitation measures, implemented by a multidisciplinary team of over a relatively short period of time allow to reduce reliably the severity of neurological and functional disorders in-apoplexy patients, as well as to adapt them to the existing exposure.

ADHERENCE IN THE CEREBRAL PALSY CHILD'S FAMILY

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Neurological pathology occupies one of the leading places in primary child disability causes. One of the most disabling pediatric diseases – cerebral palsy, with mean world prevalence is 2–3.5 cases per 1000 children. The problem of adherence is in one of the top problems of disability management. Adherence - means the patient's compliance with doctor's recommendations, including taking medication, diet and accepting lifestyle changes. An adult patient himself as a rule is an active component of the "doctor – patient" alliance, while a sick child interacts with medicine with the help of his family. The authors study the impact of various factors on adherence in 270 questionnaire forms, completed by persons accompanying inpatients in Moscow Research and Clinical Centre of Pediatric. According to the results of opinion polls, the family adherence has strong dependence on the manner of the first presentation of their child's diagnosis.

FIRST RESULTS OF SUPPORT STIMULATION METHOD APPLICATION FOR THE MANAGEMENT OF EARLY–AGED CEREBRAL PALSY CHILDREN MOTOR DISTURBANCES

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Introduction. Motor disturbances and impaired motor function development are the main reasons of cerebral palsy (CP) children disability. The development of these disorders new treatment methods based on CP pathogenesis current concept, and their introduction in clinical practice still present a challenge.

The motor function formation is known to be influenced mainly by proprioceptive afferentation in early ontogenesis period. That is why corrected proprioceptive afferentation seems to normalize the activity of impaired brain structures, dealing with motor function control, to some extent in CP children.

The support stimulation method imitates the force to feet the patient would feel while walking and standing in a proper way, resulting in formation of the powerful afferent flow regulating motor system structures' activity. Thus, abnormal tone and movement patterns can be changed and improved.

Methods. Totally 21 children, aged 12–36 months, suffering CP different types, were treated by means of support loading imitator "Korvit", providing support stimulation, from June till December 2011. Support stimulation method was included in standard rehabilitative treatment course carried out in specialized hospital. Each child received 10 procedures. Motor retardation, muscle tone reduction, feet support insufficiency and ataxic gait were the main signs in 9 patients with atonic-astatic CP. Increased flexor muscles tone, spastic gait, support need for walking on tiptoes with scissoring were typical for 12 spastic diplegia patients. Efficiency of treatment was estimated minding the passive dorsal flexion angle (triceps-test) change and movement pattern improvement before and after support stimulation procedures.

Results. Support stimulation method application in spastic diplegia patients resulted in flexor muscles tone decrease (estimated by triceps-test

change), scissoring and tiptoes walking disappearance. 6 patients began walking without the additional help. In CP atonic-astatic type children feet support improvement and ataxic gait pattern change for better (more rapid and balanced movements) were noted.

Conclusion. Our first experience testifies to support stimulation method efficiency in motor disturbances management of early-aged children suffering CP spastic diplegia and atonic-astatic types. Further investigations aimed at method efficiency criteria estimation and application individual programs working out should be undertaken to clarify its real significance for CP rehabilitative treatment system.

ORGANIZATION OF SPECIAL NEUROLOGICAL CARE FOR CHILDREN AND ADOLESCENTS WITH CEREBRAL PALSY IN MOSCOW

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According to statistics, the number of children, annually borning in Moscow, over the past five years increased by 23.6%. Unfortunately, along with a raise of annual fertility, the increase of prevalence of neurological pathology in infants by 17.7% over the past five years was marked. 86% of disabling neurological diseases in children related with pathology of pregnancy and delivery, and the outcome of this pathology in 30% of cases is recovery and in 30% of cases - persistent disability, whatever we do. The most important part of patients – are 40% of perinatal neurological cases with conventionally disabling conditions which might be partially or completely reversible due to adequate rehabilitation.

In condition of continuous growth of number of children born preterm (by 20% over the past five years), children with different neurological disorders may occupy more than 25% of capital pediatric population in the near future. At the same time, infancy is a unique time interval, when rehabilitation is the most promising, with the best response to therapy.

Currently, children's neurological service of Moscow is represented by 7 specialized neurological hospitals and 3 outpatient consultative services, 2 rehabilitation centers and 5 psychoneurological sanatoria.

Deficiency of specialized neurological hospital places leads to the formation of queues, make up a few months, what is most critical for infants. Consistency and continuity of the system of medical, social and educational help - it is an urgent need for all child neurology service of capital.

CATECHOLAMINE NEUROMEDIATION IN CEREBRAL PALSY CHILDREN

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There were correlated clinical, biochemical and neurophysiological data in 70 cerebral palsy children with catecholamine neuromediation failure (CaNF) treated by low doses L-DOPA/ carbidopa (not more than 60 mg daily of Nakom independently of age and weight of patient). All measurements realized before treatment and 1,3 and 12 months of monotherapy by the central promediator drug. The catamnesis was 7 years. The control group for biochemical investigations was 180 cerebral palsy children without clinical evidence of CaNF and 18 children with soft neurological signs after nonheritable diseases of the same age (5 – 20 years old).

All cerebral palsy children (independently of form and heaviness of affection, but generally in diplegic patients) had deficiency of adrenergic neuromediation activity, especially in dopaminergic activity. There were hyperprolactinemia (the most in CaNF patients), low dopamine-beta-hydroxylase activity, prevalence of low-affinity forms of leucocyte's thyrosine-hydroxilase, high content of ACTH and cortisol and low one of STH in plasma. These measures positively changed under the treatment (there were significant correlations).

The analysis of clinical, biochemical and neurophysiological data lets consider that the main mechanism of modulation CA synthesis (the inductance of ferments by proprioceptive stimulation) in cerebral palsy children is disturb. The initial motor deficit leads to adrenergic neuromediation inefficiency, which mediates hormone and other disorders and secondary disturbances. The low doses of central action L-DOPA-content promediator drug play the role of releaser in the breaking of pathological enchainments both in motor dyskinesis and neuromediation, hormone and common metabolism. In length of time the optimization of transmitter autoregulation occurs by decreasing of demand in L-DOPA: 7 years later only 18,33% patients with CaNF took drug treatment permanently, 21,67% episodically and 60% had no need in medicine.

INBORN REASONS OF THE BRAIN LEFT– AND RIGHT HEMISPHERE DYSFUNCTIONS IN CHILDREN

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The connection between preference dysfunction of the brain left or right hemisphere and inborn factors was studied by clinical and statistic methods. There were considered such inborn factors as the mass, the height, the index of body mass, the week of gestation, sex, peculiarities of the pregnancy and the delivery (the period of injure action, chronic hypoxia or acute asphyxia).

From random sample of 323 cases there were selected 274 ones of children 1 – 18 years old with perinatal cerebral affections (except cases of congenital developmental defects, multiple fetation, postnatal trauma and infections). The first group (167 children) had minimal brain damage, the second group (107 children) had different forms of cerebral palsy.

The preference brain left hemisphere dysfunction was associated with pre- and perinatal injure action, prematurity, hypotrophy and small-for-date fetus; the right hemisphere syndrome was associated with peri- and intranatal injures, it was more typical in mature babies. The severe perinatal pathology influences on the left brain hemisphere more, than on the right one. The left hemisphere dysfunctions prevail over the boys, especially in serious cases; the girls have the right ones in not complicated nervous system disorders.

BOTOX IN THE COMPLEX REHABILITATION OF ERB'S PALSY PATHIENTS

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The incidence of obstetric paralysis despite the obvious progress in its initial preventive cares at maternity hospitals remains high. According to Lovell & Winter in 1936 there were 1,56 per 1 000 live birth, in 1962 – 0,38 and in 2007 – 0,16 per 1 000 live birth for developed countries.

The conditions of Erb's paresis furtherance are well known: birth weigh over 4 000grams, foot presentation, crowding pen at birth, multiple pregnancy, prolonged labor and low-skilled staff at maternity hospitals (=obstetric palsy).

Fortunately over 95% of infants with symptoms of Erb palsy get cured spontaneously or after neurological conservative treatment (Edwards, 2000), 80% of them completely.

The remaining 5% of infants even after early application of microsurgical intervention on the brachial plexus, with the absence of upper limb function recovery before age of 3–9 months have a sharp increase in childhood disability and the necessity of various surgical interventions at different ages, mostly over the age of 4 years, when the potential for neuro-muscular rehabilitation of the affected muscles is mostly exhausted (Hofer, 1999).

Therefore ways of the activation of the recovery process at an early age ie before the organic contracture happens seem highly relevant.

Objective: To estimate the efficiency of BTX in the complex rehabilitation of children with Erb's paresis.

Materials and methods: Since 2007 the BTX preparation was used with 11 patients with Erb's paresis. There were 4 boys and 7 girls of 1–4 years old (av 1,6 years) 2 patients with eft sided lesion, 9 patients with right sided lesion.

BOTOX (Allergan Company) injections were performed according the common technique, on average 2.1 units/kg into muscle-target. The main trigger points were in the latissimus dorsi, the large round, subscapularis muscle, round pronator forearm, rarely in the big chest muscle and biceps.

In addition the complex included exercise therapy, massage, physiotherapy and medication treatments.

Result: Volume of active and passive shoulder and elbow joint movements were evaluated independently by an orthopedist, neurologist, physiatrist, physician-rehabilitator, gymnastics instructor massage therapist and the data had retrospective study analysis with the group without BOTOX injections.

An assessing of Mallet shoulder joint function system was applied. Estimate of the shoulder joint movement increased from 15 to 19 points.

Activation od samples: manus-mouth, manus-neck, combing hair, external rotation. During the hospital observation period (21 days) the degree in the shoulder joint abduction increased from an average of 75' to 110' (with spatula) External rotation degree increased from 10' to 30' Significant positive changes were noted starting from 3 – 5 days: increasing mobility of the shoulder joint during passive movements, reducing tension in muscles-targets.

Temperature increase (up to 37,8°C) was an adverse event with 2 patients during the first three days after the injection also there was general transient muscle weakness with 1 patient.

Conclusion: The usage of injectable BOTOX in the trigger zone of the antagonist muscles of the affected muscle is a promising direction in the early rehabilitation of patients with Erb's paresis.

BOOSTING PARTICIPATION POTENTIAL FOR CHILDREN WITH CP USING A SHORT INTENSIVE INPATIENT REHABILITATION PROGRAM

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Background: Over a period of several months, groups of children with cerebral palsy from Siberia were treated at the ALYN Hospital Pediatric and Adolescent Rehabilitation Center in Jerusalem, Israel. Previous to their arrival, the children were treated regularly, though intermittently, using a variety of non – active methods, but have not been exposed to NDT-based participation-goaled interventions. Individualized treatment programs were designed to define adapted equipment and provide hands-on multidisciplinary therapies. Program included intensive exercising to maximize the caregiver's proficiency in providing long term continual treatment back in their home-setting.

We present the short term benefits and achievements of 36 CP children ages 2.7–13 years, GMFCS 1–5, of which 15 were diplegic, 11 quadriplegic 7 hemiplegic and 2 athetoid. We analyzed their achievements using PEDI, GMFCS and Gillette scales.

Results: mean treatment duration was 23 days (range 8–60 days). Children received daily physiotherapy, occupational therapy, speech therapy, hydrotherapy and fitness exercises. All children were fitted with ankle-foot orthoses (except 2 who underwent surgical interventions first). 22 were fitted with walkers, and 6 were given age-sized tricycles as a mobility too. 17 children were fitted with adjusted wheelchairs and 11 children were fitted with ADL accessories. 10 children were fitted with upper extremity splints and 7 received alternative-communication boards. 69% of children showed significant improvement on the Gillette scale, of which 31% showed improvement on more than one category. The median mobility mark which was 1 (cannot take any steps at all) on admission improved to 3 (walks for exercise in therapy and/or less than typical household distances) ($p<0.01$). There was no correlation between functional pattern and change in mobility.

Conclusions: Functional goal-oriented short term intensive rehabilitation program improves mobility and potentially impacts participation of children with CP.

Long term success of the program will depend on the ability of parents and environment to continuously implement the guidance given, adapted to the educational and home settings. Further data will be collected as the program continues and are followed and re-evaluated after a period in their home community.

NEUROSURGICAL TREATMENT OF SPASTICITY IN CEREBRAL PALSY

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Cerebral palsy, spasticity, spinal cord stimulation, selective dorsal rhizotomy, selective nevrotomy

Spastic syndromes are one of the main problem in patients with cerebral palsy (CP). It is significant to choose optimal tactic in treatment of spasticity in each case.

Material and methods: 98 patients with CP have been operated. 32 patients with severe spastic tetraparesis have been underwent selective dorsal rhizotomy (SDR) on lumbar level. 51 patients with spastic low paraparesis (40 cases) and moderate spastic tetraparesis (11 cases) have been underwent chronic spinal cord stimulation (SCS). In 15 patients with local spastic syndromes selective nevrotomy has been performed. The follow-up was from 6 month till 9 years.

Results: Decreasing of the spasticity after SDR have been observed in all cases till 1–2 point (Ashworth scale). We also have observed decreasing of muscle tone after selective nevrotomy. After SCS significant decreasing of spasticity have been observed only in patients with spastic low paraparesis.

In follow-up the clinical effect was stable after SDR and nevrotomy in all cases. After SCS the clinical effect was observed only in patients with spastic low paraparesis. 10 patients from this group have finished SCS because the muscle tone have kept on almost normal level. We have explant the IPG in these patients. In all patients with spastic tetraparesis we have observed recurrence of the spasticity.

Conclusion: SCS can be method of choice in CP patients with spastic low paraparesis. SDR can be method of choice in CP patients with spastic tetraparesis. In patients with local spasticity and resistance to botulinic toxin selective nevrotomy gives good results.

RECOVERY OF THE PRONUNCIATION ASPECTS OF SPEECH IN HOSPITAL ENVIRONMENT IN A FEMALE PATIENT OF YOUNG AGE WITH SPASMODIC ATAXIC HYPERKINETIC DYSARTHRIA DUE TO EARLY ORGANIC LESION OF THE CENTRAL NERVOUS SYSTEM – A MIXED FORM OF INFANTILE CEREBRAL PARALYSIS

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The objective was to examine the specifics of recovery of the pronunciation aspects of the speech of a teenage female patient with spasmodic ataxic hyperkinetic dysarthria due to early organic lesion of the central nervous system – a mixed form of infantile cerebral paralysis.

Material and methods. The study involved a patient aged 18 with the consequences of early organic lesion of the central nervous system – mixed-form of infantile cerebral palsy, a spinal injury, which featured mild cognitive impairments. Speech status of the patient featured spasmodic ataxic hyperkinetic dysarthria. The expressivity of the defect was medium severe. The patient had impairments of the pronunciation aspects of speech: the intelligibility of speech was reduced, the tempo pathologically slowed down, and the rhythm extended in time. Physiological inhale was short, and the physiological exhale was made with hyperkinesis. Differentiation of her nasal and oral exhale was broken. The patient's speech exhale was short. Her voice was weak, muffled, tense, nasalized and underintoned. Synchronicity of breath, phonation, and articulation was broken. There was spastic paresis of the muscles of her vocal apparatus. The range of articulatory movements was incomplete, and the patient could not always keep the accuracy of her postural pose. For the patient's speech was typical the neutralization of vowels, devocalization of voiced consonants, vocalization of voiceless consonants and nasalization of oral sounds, as well as deviant intonation due to the lack of comprehensive oral sense and reliance on the auditory analyzer in self-control.

Results and discussion. The study showed that an effective way to correct the pronunciation aspects of the subject's speech in hospital environment turned out to be a combination of speech therapy aspect of recovery conventional for dysarthria, the system of psychological impact,

the use of individual and group speech therapy sessions, ergotherapy, and rehabilitative training aimed at reducing the cognitive defect.

Conclusions. Recovery of the pronunciation aspects of the speech in a young-aged patient with spasmodic ataxic hyperkinetic dysarthria in hospital environment required compliance with a variety of conditions. They were the speech therapy aspect of the recovery, the system of psychological impact, the use of individual and group speech therapy sessions, ergotherapy, and rehabilitation training aimed at reducing the cognitive defect. The said specificity must be considered when planning the rehabilitation training of patients of this category.

ORGANIZATION OF MONITORING AND INTEGRATED ASSESSMENT OF REHABILITATION OF CHILDREN WITH CEREBRAL PALSY AND OTHER MOTOR DISORDERS AT THE MODERN SCIENTIFIC AND PRACTICAL MEDICAL CENTER

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Purpose: To develop a system of monitoring and assessment of complex rehabilitation of children with cerebral palsy and other motor disorders. At the scientific and practical center "Bonum" (SPC "Bonum")a multilevel system of disease prevention, diagnostic, therapeutic and rehabilitation services for children of Sverdlovsk region with severe health disorders (with a congenital maxillofacial pathology, congenital and acquired diseases of the musculoskeletal system, nervous system and organs of hearing and vision) has been worked out and implemented. Principles of regenerative medicine are the basis of the system, they mean the early beginning of rehabilitation and habilitation (from the first months of life), the inclusion of the family as the main member of recovery process, development and social adaptation of the child, staging and continuity of the process, and a multidisciplinary approach as well.

The dispensary group of the regional center of perinatal neurology of the SPC "Bonum" consists of children with cerebral palsy and infants of "risk group" for the development of motor disorders.

On the basis of modern diagnostic and therapeutic technologies of rehabilitation algorithms for the early complex rehabilitation of children with neurological pathology, as well as standards for the specialized medical care to children with cerebral palsy and other motor disorders have been developed. The technology of rehabilitative care at the center means an assessment of the rehabilitation potential of the child before the start of rehabilitation, selection (according to this estimate) of individual rehabilitation program with a specific sequence of steps that contain a set of consultative, diagnostic measures and rehabilitation activities, as well as step-by-step and the final assessment of the effectiveness of the rehabilitation process.

Due to the lack of generally accepted criteria of assessment, in order to improve the quality of the technology at the SPC "Bonum" we started the project of monitoring and development of criteria for evaluating of reha-

bilitation potential and effectiveness of rehabilitation at every stage. To improve the efficiency of expert work the technical specification for making an automated system for support of rehabilitation activities is developing.

Conclusions: The adoption of modern rehabilitation technologies of diagnostics and treatment of children with cerebral palsy and other motor disorders, on a number of improvement of approaches to assessment of the clinical effectiveness and economic feasibility will optimize the terms and the quality of the rehabilitation.

NEUROPSYCHOLOGICAL SYNDROMES OF INFANCY

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The psychological development of 77 babies with mild perinatal encephalopathy and the preference of one of the brain hemisphere dysfunction was analyzed by O. Bazhenova scale (1986).

The lateral neuropsychological syndromes of infancy have the typical features in every sphere of psychics. The base of their breaches is combination of the general neurodynamics and the leading activity, which determines the structure of psychic development impairment and its age dynamics.

The right hemisphere syndrome is characterized by weakness of reaction and immediate emotional communication, accelerated development of complicated and mediated modes of communication, interest for item operations. The left hemisphere syndrome is characterized by high reaction on stimulation with generalized activity and regulation weakness, retardation of complicated and mediated modes of communication and item operations, but good development of immediate emotional communication. The left hemisphere syndrome children peculiarities aggravate in the excess of impressions and stimulations, and in those with the right hemisphere syndrome – in their limitation and stability.

Lateral neuropsychological syndromes of infancy have both the diagnostic magnitude and the practical value for determination children groups with risk of development deviations and realize differential approach to their correction.

EPILEPSY AND EPILEPTIC SYNDROMES IN CHILDREN WITH EXTREMELY LOW BIRTH WEIGHT

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Every year at least 3 thousand infants are born with extremely low birth weight (ELBW) in Russia. Their survival rate is 45%.

The objective of the study was to evaluate the clinical features of the epileptic syndrome in ELBW children.

Methods. The study was conducted in Kazan Children's Municipal Hospital № 8 and included 132 patients with ELBW who received outpatient and inpatient treatment

Results. Epilepsy and other seizure disorders (neonatal seizures, febrile convulsions) occurred in 35 (26%) children. Boys were more affected than girls (62%).

Neonatal seizures were diagnosed in 20% (7/35) of ELBW children. Seizures in the neonatal period were correlated with the severity of structural brain damage (periventricular leukomalacia, intracranial hemorrhage). 11% of children who had neonatal seizures in the first 48 hours after birth had no recurrence in the future. Seizures in newborn period of ELBW infants were associated with presence of epilepsy in 86% of cases.

Only one patient aged 1 year 2 months had febrile convulsions. Febrile seizures in our study did not recur.

Epilepsy was diagnosed in 94% (33/35) of ELBW children who had different types of seizures. Epilepsy was seen in more severe cases of periventricular leukomalacia (grades 3 – 4) (80%). All patients with epilepsy had a significant problem in motor development. Nine patients (27%) had cortical atrophy, cortical dysplasia, tuberous sclerosis, and hypoplasia of the corpus callosum in magnetic resonance imaging.

Epilepsy was manifested as West syndrome in 51%, and as focal (multifocal) symptomatic epilepsy – in 49% of cases.

Prognosis depended on the type of epilepsy: often children lost previously acquired motor and cognitive abilities.

Conclusions: ELBW infants have an increased risk of developing severe forms of epilepsy, such as West syndrome and symptomatic focal epilepsy.

APPLICATION OF CHRONIC EPIDURAL STIMULATION OF SPINAL CORD (SCS) FOR CHILDREN WITH LOWER SPASTIC SYNDROMES

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From data of row of authors frequency of children cerebral palsy varies from 2,5 to 6 cases on 1000 new-born. One of principal reasons of invalidisation of patients is a spastic syndrome. International researches testify that conservative therapy not enough effective for his adequate correction, therefore neurosurgical methods are especially actual in treatment of spasticity.

Research purpose: introduction of modern methods of surgical treatment for patients with spastic syndromes.

Materials and methods: in a period from 2007 to 2011 we execute 10 operations on implantation of SCS systems for children with a spastic syndrome. Principal reason of appeal was a high myotonus, rudely defeats autokinesias and walking, hampering a rehabilitation and development of motor skills. All patients repeatedly passed conservative, rehabilitation treatment without a substantial effect. An inspection included the quantitative estimation of spasticity (Ashworth scale), complex estimation of locomotion functions (GMFM-66), X-ray examination, videoregistration. For all patients the onechannel stimulators ITREL 3 (Medtronic) were implanted.

Results: a catamnesis made from 4 months to 4 years. Positive results are got in all supervisions; in a remote period: excellent – 7, good – 2, satisfactory – 1. For all patients the decline of myotonus was marked in lower extremities, regress of miogenic contractures, improvement of walking skills. In seven supervisions is an improvement of motor functions on one category on GMFM; for six patients is an improvement of intellect (memory, attention), at seven is an improvement of motive activity in hands.

Conclusions:

1. SCS is the effective method of treatment of lower spastic paraparesis.

2. Along with the positive dynamics of walking at the row of patients the improvement of intellect and motor function of overhead extremities is marked.

3. The effect of stimulation in a great deal depends on complex approach (neurosurgical, orthopedic, active rehabilitation treatment).

ANKLE–FOOT ORTHOSIS TREATMENT FOR CP CHILDREN

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Objective: to measure the effect of AFO on the stability of standing

Method: We analyzed the effect of AFO on the stability of standing among children receiving conductive education at the "András Pető Institute". 11 children with cerebral palsy between 6 and 11 years of age participated in the examination. Measurements were conducted in the biometric laboratory of the institute with the help of a DIASU stabilometer.

Results: Concerning the stability of standing, conclusions were drawn from the change of the area of the confidence ellipsis. When standing for 20 seconds in AFO, in 82% of the cases the area of the ellipsis significantly decreased as compared to standing barefoot. For standing without AFO, considering the results of all subjects (N=11), the average area of the confidence ellipsis was 13.95 cm^2 (spread: 13.32), while this values decreased to 5.94 cm^2 (spread: 5.33) when standing in AFO.

If only those are considered whose standing was improved by AFO (N=9 ; 82%), the improvement was 67% as compared to the 11% for the total sample (N=11).

Conclusion: These results prove the efficiency of the AFO treatment. The fact that standing stability did not improve in all cases can be explained by an inappropriate choice of AFO or by its inappropriate making.

As is known, in addition to increasing standing stability, an AFO can also positively influence muscle tone, position the heel, protect the joints of the foot from deformities and make walking more dynamic.

EFFECT OF SPASTICITY ON EXTRACELLULAR MATRIX REMODELING IN TENDONS FROM CEREBRAL PALSY PATIENTS

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Cerebral palsy (CP) is characterized by an impairment of voluntary movement related to hypertonia and spasticity, producing a progressive alteration of the muscoloskeletal system, with direct involvement of tendons. The exact mechanism by which spasticity-induced overload affects tendon homeostasis is however still poorly understood. Since mechanical loading may affect the homeostasis of the connective tissue of tendons by modifying some of their metabolic, morphological and biomechanical properties, we studied tendon structure and the expression of genes involved in collagen turnover in the gracilis and semitendinosus tendons of diplegic and quadriplegic patients, compared to normals.

The study included tendons of diplegic (n=6), quadriplegic (n=15) and normal subjects (n=7).

Using real time RT-PCR, we analyzed the mRNA levels of the major extracellular matrix (ECM) components such as collagen type I (COL-I), the matrix metalloproteinase-1 (MMP-1) and the tissue inhibitor of MMP (TIMP-1), the enzyme responsible for collagen maturation lysyl hydroxylase 2b (LH2b), of the matricellular protein involved ECM remodeling (Secreted Protein Acidic and Rich in Cysteine, SPARC), and the transforming growth factor-β1 (TGF-β1), a multipotent cytokine involved in collagen turnover. We also analyzed tendon structure by morphological analysis of paraffin embedded sections stained with hematoxylin-eosin, sirius red and alcian blue.

The results show that hypertonic quadriplegic subjects displayed the highest mRNA levels of COL-I, LH2b, TGF-β1, and SPARC, suggesting that spasticity affects tendon extracellular matrix remodeling in order to respond to the increased mechanical loading.

Light microscope analysis revealed that CP induced in tendons hypercellularity and glycosamonoglycans increase, as observed in tendinopathy.

PATHOGENETIC MECHANISMS OF FORMATION OF GENOME INSTABILITY IN CHILDREN WITH CEREBRAL PALSY

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Lately most of researches begin to think, that the most frequent reason of motor disorders at cerebral palsy (CP) is periventricular leukomalacia (PVL) in full-term infants and especially in preterm ones. Numerous studies have shown that genetic programs and environmental regulation of nervous system formation are primarily controlled by matrix periventricular area. Different articles have evidence that one of the causes of motor deficit at CP is genome instability, manifestating in increasing the level of erythrocytes with micronuclei (EM). It is supposed that the basis of this phenomenon is intensification of mutagenesis processes in patients due to increased endomutagenic generation and reducing antimutagenic systems of protection. The genome destabilization mechanisms to be unclear.

There exists an opinion that pathological changes of periventricular area structures can be initiated during intrauterine period or the period of labor, and can proceed during all childhood. In this case there occurs lesion of autoregulation and selective vulnerability of periventricular area vessels, and this leads to chronic ischemic process in brain, which biochemical substratum is oxidative stress. When there is an abundant formation, free radicals influence a cell, leading to different cytogenetic lesions and as a result of it, to its destruction.

Aim: to study correlation of EM and oxidative stress intensity in children with CP.

Material and methods: examined 51 children with spastic forms of CP (spastic diplegia and double hemiplegia, from1 to 5 years old) and with only PVL, found during neurovisualization. Control group – 20 healthy children. Both groups can be compared by age.

Cytogenetic lesions were studied in erythrocytes of peripheral blood with the help of micronucleus test. We were investigated the activity of superoxide dismutase (SOD) in blood and malondialdehyde (MDA) in plasma. Statistic processing of the results: non-parametric t–criterion by Mann-Whitney and correlation analysis according to program Origin 6.1.

Results and their discussion. Cytogenetic study has revealed an increased number of EM in each examined child with CP, and this exceeded

reliably the index of spontaneous mutagenesis ($p<0,001$). Revealed cytogenetic lesions are evidence of genome destabilization in the examined patients. The most probable generators of endomutagenesis in children with PVL might be active of oxidative stress.

Study of enzyme activity of antiradical protection in blood (SOD) of CP patients with PVL revealed their high level, as compared to the control group ($p<0,05$). Studying the contents of lipid peroxidation products (MDA) has been revealed, as compared to the control group ($p<0,002$). On the basis of the revealed increase of SOD and MDA we can judge about the course of antiradical oxidative stress in children with PVL, having spastic forms of CP.

Thus, the obtained results of biochemical and cytogenetic investigation testify to presence of two pathological processes, proceeding simultaneously in children with PVL.

Correlation analysis has been demonstrated that both processes are interrelated with each other: the level SOD correlates backwards to the EM number ($R=–0,6$), and by MDA was found out a direct correlation with a number of EM ($R=0,67$). Negative correlation of SOD activity can be connected with insufficient activity of antiradical enzymes for genom protection on the basis of increasing oxidative process activity. Under these conditions increased presence of MDA expresses its apparent cytotoxic effect – genome destabilization.

Results of investigation showed that in CP patients with PVL strong oxidative stress provoke genome destabilization. The obtained results make it possible to suppose that oxidative stress leads to destabilization of cell genome in patient and maintains processes, proceeding in periventricular area, and it contributes to aggravation of existing pathological processes and emerging new ones in the patients.

SURGICAL MANAGEMENT OF EQUINEPLANOVALGUS FOOT DEFORMITY IN SPASTIC CEREBRAL PALSY

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Equineplanovalgus foot deformity (EPVFD) in spastic cerebral palsy is widespread complex problem which mainly causes the locomotary violations in these patients. We observed 29 spastic diplegy patients with EPVFD of both gender in the age of 8–29. In 14 patients in the age of 8–12 we performed corrective osteotomy of calcaneum with homoplastic bone wedge in our own methodic (19 feet). In 11 cases it was combined with Achilles tendon lengthening by Bayer (lateral portion of the tendon was cut of from the calcaneum), in 8 cases the Strayer procedure had been done before. Postoperative plaster immobilization took place for 1,5 month, then patients started the rehabilitation treatment, including physiotherapy, hydrokynesotherapy, massage. All the patients were provided with foot and ankle orthoses, orthopedic shoes.

In 15 patients (24 feet) we performed corrective triple arthrodesis of the foot using two (medial and lateral) approaches and fixed the bones with Ilizarov wires. In 14 cases it was combined with Achilles tendon lengthening. Postoperative immobilization took place for 3 months. Then patients were subjected to rehabilitation treatment which was similar to the previous group.

The following methods of examination were used: assessment of the moving disorders according to the GMFCS, X-ray examination, computer podography. Almost in all cases we achieved good and satisfactory results which concluded in achievement the higher level in GMFCS, decrease of valgus hindfoot position and calcaneum inclination in X-ray examination and more symmetrical dispersion of body weight on the feet, appearance of the initial heel contact (in 67%) in results of computer podography. In 3 cases the results were considered to be unsatisfactory that to much degree was caused by uncompleted rehabilitation treatment and refuse from proper orthopedic management. In younger age group we achieved better results (44% of the patients achieved independent walking).

So, the proper and accurate surgical management of the EPVFD in spastic cerebral palsy combined with adequate rehabilitation treatment and

support with orthopedic devices can give good results. Two things are most important to our thought:

1) To start surgical treatment not too late – 6–9 years for spastic dyplegy is the most correct time;

2) To conduct the surgical, rehabilitation and orthopedic treatment in one institution that gives possibility to coordinate the process.

OCCURRENCE AND NATURE OF SYMPTOMATIC EPILEPSY IN CHILDREN WITH CEREBRAL PALSY

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Introduction. Occurrence of epilepsy considerably complicates the course of cerebral palsy in children. Prediction of outcome of the disease in such patients is very difficult, the course of the disease is complicated, and the potential of recovery (development) of functions affected during the ontogenesis or retarded in development is reduced. Further study of clinical aspects of the problem is required.

Aim of the study. The aim of the study was to analyze the rates of occurrence and clinical particularities of symptomatic epilepsy in children with cerebral palsy.

Method. A clinical survey of 535 children with cerebral palsy was carried out. Occurrence and nature of various clinical types of symptomatic epilepsy was studied.

Results. The symptomatic epilepsy was diagnosed in 150 (28%) patients with cerebral palsy involved in the survey. The rate of occurrence of epileptic seizures at given children depended on cerebral palsy type was following. The epileptic seizures were noted in 29 (59.2%) of 49 children with spastic cerebral palsy (quadriplegia), 56 (19.2%) of 291 children with spastic diplegia, 33 (38.8%) of 85 children with hemiplegia, 29 (28.7%) of 101 children with ataxic form and in 3 (33.3%) of 9 children with dyskinetic form of cerebral palsy.

In 60 (40.0%) children seizures were focal, in 56 (37.3%) – generalized, and in 32 (21.3%) of patients a combination of both generalized and focal seizures was found. In 2 (1.3%) of patients seizures without unequivocal generalized or focal features were established.

Certain correlation between types of seizures and clinical form of cerebral palsy could be traced. Thus, in case of spastic cerebral palsy (quadriplegia) generalized seizures (55.2%) and a combination of both generalized and focal seizures (41.4%) were basically observed.

In case of spastic diplegia approximately the same rate of focal (44.6%) and generalized (42.9%) seizures was observed; combination of both generalized and focal seizures was not very common (10.7%). In patients with

hemiplegia observed mainly focal seizures (75.7%), whereas in children with ataxic form generalized seizures prevailed (44.8%).

No reliable data was obtained regarding the incidence and nature of symptomatic epilepsy in dyskinetic form due to a small amount of supervision.

The first epileptic seizures arose during the different periods of patient's life, including the first year of life (49.9%) when the basic motoric stereotype has not been generated. Moreover, most of the first occurrences happened when children were 1 to 12 month old (30.6%). This was particularly true for patients with spastic cerebral palsy (quadriplegia – 58.6%). The rate of occurrence of initial seizures further decreased with the age of patients.

In most cases (64.7%) the first clinical manifests of epilepsy were provoked by various factors, of which the most important were pathological conditions during the post-natal adaptation period (28.9%), consequences of medical – regenerative treatment (29.9%) and acute respiratory infections (26.8%).

We have also found that in patients with cerebral palsy up to one year old generalized seizures prevailed (52%) whereas in those over one year of age focal seizures mainly developed (58.7%). This is an evidence of higher percentage of focal seizures among the older patients with cerebral palsy.

Conclusions. The results of our research show that symptomatic epilepsy is quite a common phenomenon among children with cerebral palsy (about 28%). Manifests of epilepsy largely depend on clinical form of cerebral palsy and in half of all cases occur during the first year of age even before the disease is diagnosed.

CEREBRAL PALSY IN THE WORLD OF MOTION PICTURES

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Background and Objectives: The impact of the media in creating the image of a man is tremendous at the present time. The depiction of disability in the motion picture plays a major role in forming public perception of disability as well. This study presents how movie arts illustrate a person with cerebral palsy (CP), the social impact from the media and the possibility of cerebral palsy education by the motion pictures.

Materials and Methods: Over 900 motion pictures were reviewed in this study. The data of motion pictures was mainly obtained from major websites including The Internet Movie Database (IMDb) and FilmWeb. With the criteria of non-documentary movies, possibility of disability classification and availability, the total number of motion pictures about CP was reduced from 932 to 34.

Results/discussion: Timeline – The motion pictures about CP range from 1932 to 2011. With the 5-year interval, the number of movie productions increased since 1990 and began to drop from 2005. The changes are due to the social awareness of the CP and later with the changes of focus of the movie industry. Geographical Distribution – The total number of 34 movies distribute as America: 12, Europe: 11, Australia: 2, India: 2, East Asia: 6. This distribution represents the development of movie industry and the social attitude to CP patients. The CP incidences in the real world and in the motion pictures are compared among different motor types and among different Gross Motor Function Classification System (GMFCS) levels. Comparisons of incidence between the real world and the movies are surprisingly matching. This also reflects the general public's point of view to the CP patients.

Conclusions: Motion pictures are not only for the entertainment business but also for the education. They honestly reflect the general public's point of view to our real world. CP is an unneglectable disease nowadays. The proper information about CP needs to be distributed to general public and medical students. With precise selection and medical professional explanations, motion pictures can play the suitable role making CP to be understood more clearly.

THREE–DIMENTIONAL COMPUTER EVALUATION OF ORIENTATION AND CAPACITY OF DYSPLASTIC ACETABULUM IN CEREBRAL PALSY

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Background and Objectives: The most important part of surgical treatment of children with hip joint dislocation is a pelvic osteotomy. The objective and reproducible determination of acetabular orientation and the volume is an important prognostic factor. The purpose of this study is to present a new universal method to determine the volume of the acetabulum and to propose a complete methodology that allows the determination of acetabular axis and the measurement of angles related to each reference plane in both healthy and dysplastic subjects.

Materials and Methods: The study evaluates computer models reconstructed directly from regular computed tomography (CT) imaging of patients with dysplastic hip acetabulum. The real-sized computer model was obtained from the CT imaging by the reverse engineering technique. The model was exported to the computer-aided design (CAD) software for further measurements. Acetabular parameters including volume, orientation and sphericity are measured with the proposed methods. Reference planes and axis for determining the acetabular orientation was defined with specific anatomical structures. Acetabular volume and sphericity are also measured by proposed computer methods and a formula index. To verify the developed method and the estimation of measurement, an error control test was performed on a polyethylene acetabular implant with the known geometry.

Results: Comparing the measurement results in the image of a normal and dysplastic acetabulum in examined patients disclosed significant differences in the orientation of the acetabulum, depending on the pathology involved. The determined acetabular axis has a different orientation in dysplastic conditions. This shows applicability of the method in clinical treatment. There are also huge differences among both dysplastic acetabulum concerning its volume and sphericity. This result does not support the common orthopedic opinion about the shallow, small volume dysplastic ac-

etabulum. On the basis of presented evaluation, the examined acetabulum presented quite different types of deformations. The tendencies of their spherical orientations are similar but different from the normal sides.

Conclusions: Proposed methodology for the evaluation of acetabular morphology enables and facilitates the therapeutic decision and the assessment of treatment outcome in patients with neurogenic, congenital, developmental or other deformity of the hip. It is possible that it will reduce the incidence of adverse effect of such a distant secondary deformation such as osteoarthritis. The presence of this measurement method appears to be essential for orthopedists to make the right diagnostic and therapeutic decisions.

YOUNG CHILDREN HABILITATION – MODERN MEDICAL – SOCIAL REHABILITATION TECHNOLOGY

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Current moment is marked by the improvement of the infrastructure that provides support for people with special needs, which is defined as a social priority by the the government of Russian Federation. Social targeted programs which St. Petersburg government endorsed in 1992, among them "Infant habilition program", developed by the Early Intervention Institute using international and especially Swedish experiences and approaches (later it became the part of St. Petersburg's medical-social "Children with Disabilities" program) – were in fact a breakthrough in the traditionally moulded organization of medical help for the children with developmental disabilities. The capabilities for medico-social support of children were fundamentally broadened.

UN experts estimate the number of people with mental and physical disabilities at 10% of the total Earth population, i.e. more than 500 millions of people, more than 100 millions among them are children under 17. At the end of 2010 there were a little more than 14 thousands children (20,9 per 1000) with disabilities under the supervision of children's polyclinics (including 'Children psychiatry' Department) in St. Petersburg. There were no significant changes in the last five years in the structure of the most widespread children's disabling health conditions/diseases: congenital developmental defects, neurological diseases, endocrine diseases, respiratory diseases, but from 2005 year mental disabilities rose to the first from third places. Between children with disabilities children from 0 to 4 years make up the fourth place (12 – 14%), with the first place going for children aged 10 – 14 (33 – 35%). This proves the importance both for diagnostic of disabilities and of the preventive measures at the earlier age.

Vigorous efforts of the Early Intervention Institute and its Swedish colleagues in setting up various educational programs and projects, the support of the St. Petersburg government, various committees and departments, helped in creation of the early intervention services in the city's children polyclinics. Currently the city health care system includes early

intervention services in the 17 children polyclinics, "City center for the restorative care for children with psycho-neurological disorders", city children hospital №17. Since 1992, in the 19 years of joint efforts of Early Intervention Institute and Swedish colleagues the practical health care had organically accepted a new direction for the multi-staged support for children with limited abilities: "habilitation".

This means development of the mechanisms:

- for early detection of children with different kinds of impairments, diagnostics of the level of impairments,
- setting up individual programs for the child's monitoring/supervision and the family support,
- providing multi-faceted specialized help with the staged continuity,
- motivation of the family for the active involvement in the child's development and 'life',
- education of the family.

Assessment of the activities of early intervention services in St. Petersburg polyclinics and "CCRCCPND" demonstrated their high efficiency. Every year about 9 thousands of children receive help in early intervention services. Polyclinics that host early intervention services observe the heightened activity of the families, their interest and readiness for the joint involvement. Early intervention services are an essential element in the activities of organizations belonging to any department (health, social, education) that provides medico-social support to the children with different kinds of disabilities. Only with the participation of all these departments and support of the State can the further development of the early intervention services be possible.

USING OF GAMING METHOD IN REHABILITATION OF CHILDREN WITH ARTHROGRYPOSIS

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One of the primary goal of socio-pedagogical rehabilitation is an involving of patients in rehabilitation process. It is necessary at work with children with locomotive system disorder to take into account theirs age-related features, leading activity and physical potential. At the preschool and primary school age the leading activity is a game. Therefore the successes of rehabilitation measures depend on using of gaming method at work.

Children with locomotive system disorders have their own development characteristics, which are conditioned by the disease level, features of a clinical current, duration of treatment and stay in the clinic conditions.

A child with Arthrogryposis has also his own features. Arthrogryposis, or arthrogryposis multiplex congenita (AMC) is a congenital nonprogressive limitation of movement of two or more joints in different body areas. Usually, children with Arthrogryposis have not damaged intelligence.

Gaming method is widely used in The Turner Scientific and Research Institute for Children's Orthopedics. The course of rehabilitation treatment is necessary after surgical treatment. The course involves physiotherapy, therapeutic physical training, massage, robotic treadmill therapy (LOKOMAT and ARMEO) and also occupational therapy. The special room for occupational therapy is organized with account of physical and age development of patients: games for fine motor skills, thought, role-playing games and creative work. The age of patients is from 3 to 8 years.

Many sources about the rehabilitation of children with locomotive system disorders are dealt with Cerebral Palsy patients. Most of these methods are suitable to patients with Arthrogryposis. However the work with child with Arthrogryposis has its own features, which depend on physical potential and specific goal of rehabilitation. So, there are several stages of course: definition of a goal, which is corresponding with surgical treatment, definition of games, aktivization of a limb, gradual complications of tasks. Each lesson consists of few tasks, which are presented as a game. One of the most important conditions is the retention of the correct position.

As a result:

- A Child lost a fear of using the operated extremity, excessive "cautious" disappears ;
- A Child learns how to grasp and hold objects, so he makes a necessary motor pattern;
- Developing of intelligent and emotional sphere, communicative skills are taking place;
- A Child develops skills for self-service and independent life, which is the main goal of all the medical and rehabilitation actions.

Thereby gaming method takes an important place in rehabilitation of children with Arthrogryposis.

TREATMENT CEREBRAL PALSY. FORMATION OF ALTERNATIVE IMPELLENT STEREOTYPES

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Normal development of the child probably at normal development of physiology paravertebral zones i.e. not only the backbone, but also its{his} muscular corset. Therefore patients with cerebral palsy cannot develop standard impellent stereotypes because of arising restrictions, tetra or paraparesis. The insufficient attention to physiology paravertebral zones leads to that in due course the volume of mobility continues to be reduced. The complex of exercises on development of a backbone and п paravertebral zones at patients with cerebral palsy has appeared ineffective as in usual physical training, and, especially, in physiotherapy exercises. Therefore for patients with cerebral palsy and attributes deep tetraparesis have applied complexes KUMP to treatment of a pathology of a backbone. Researches have shown, that on installation is possible {probable} or restoration of a normal impellent stereotype, or is developed{produced} alternotiv an impellent stereotype which as much as possible realizes opportunities of the child.

Conclusions. Use of complexes КУМП allows to compensate development of secondary restrictions at cerebral palsy and to develop {produce} alternative impellent stereotypes.

AVASCULAR NECROSIS AS A COMPLICATION OF SPASTIC HIP DISLOCATION TREATMENT.

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Purpose: to present frequency and risk factors of femoral head avascular necrosis appearance in the course of spastic hip dislocation treatment in children with cerebral palsy)

Material: We analyze a group of 77 patients (109 hip joints) with hip joint dislocation (MP>80%). 31 patient had bilateral dislocation and 47 had unilateral dislocation. Patients were traeted in our department between 1998 and 2008. Inclusion criteria was at least one year of observation. Mean time of follow up was 3,2 years (from 1, 2 to 10,2). In our group 58 hips were male and 51 were female.

Methods: We evaluate shape of femoral head according to Miller criteria, and search for avascular necrosis according to Kruczynski classification. We also perform the clinical examination of hip joints (mesurment of range of motion) and analysis of the x-ray of the hip joints in a-p view before operation and at latest follow-up. The relation of the femoral head to the acetabulum was evaluated in all x-ray by Acetabular Index (AI) and Reimers migration index (RM).

Results: Acetabular index improved from 30,9° before open reduction procedure (10 to 62) to 21,1° at the last follow-up (3 to 50), Reimers Migration Index improved from 98,8% (82% – 100%) before the operation to 15,6% (0% – 100%) at the end of observation. The observed change of AI and RM was statistically significant. In our group at last follow up we had 3 dislocation and 3 severe subluxation. According to Kruczynski classification in 36,7% there was no signs of AVN after operative treatment, in the rest – 63,7% of all patients changes of proximal femoral end were observed: in 33,0% of hips – type Iº, in 14,7% – type IIº, in 3,8% of cases – IIIº, in 7,4% type IVº and type Vº in 4,8% of hips. Estimation of femur head shape accordig to Miller preoperatively we had 50 hips type I and 59 type II. After surgery we observed 45 hips in type I, 49 as type II and 15 as type III. This deterioration was statistically significant ($p<0,001$). Change of femur head shape depends on postoperative AI, age at the time of surgery, postoperative range of abduction and post-op spasticity of iliopsoas

and adductors. Appearance of femoral head avascular necrosis is closely connected to preoperative value of neck-shaft angle, intraoperative correction of neck-shaft angle, post-op range of abduction and post-op spasticity of adductors, iliopsoas, rectus muscle.

Conclusion: Although open reduction of hip joint combined with derotation-varus-shortening femoral osteotomy and Dega pelvic osteotomy is clinically effective treatment of spastic hip dislocation in cerebral palsy children, we observed in almost 2/3 of all cases signs of avascular necrosis. Majority of them present minimal to mild changes, which don't give any clinical symptoms.

GROWTH OF THE PROXIMAL FEMUR AFTER THE SPASTIC HIP DISLOCATION TREATMENT

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Objectives: To present geometrical changes of the proximal end of femur before and after the spastic hip dislocation treatment.

Material: We analyzed 81 patients (115 hip joints) with hip joint dislocation (MP>80%). 34 had bilateral and 47 had unilateral dislocations. Patients were treated surgically by open reduction and DVO. The follow up mean time was 3.5 years (from 1.2 to 13.8).

Methods: The proximal femoral geometry including neck-shaft angle and anterversion angle was measured during the surgery. The radiological evaluation consist of: Epiphyseal-Shaft Angle (ESA) which describes the orientation of growth plate, Reimers MP, AI on pelvis a-p x-ray before surgery and at the latest follow up. The presence of AVN and wind-blow deformity was assessed on x-ray obtained one year after surgery.

Results: ESA changed from av. 82 before surgery to 54 after surgery. In the group with unilateral dislocation, the ESA before surgery was 78 degrees and was 54 after surgery. We observed slight changes of ESA for non-operated hip joint from av. 78 to 72 during the follow up period. Pre- and post-operation changes of ESA were statistically significant. The correction of ESA is related to the correction of Neck-shaft angle ($p = 0.001$, $rs = 0.256$) and the correction of femoral anteversion ($p = 0.01$, $rs = -0.218$). After surgery, only 1/3 of all hip joints have ESA over 65 degrees, which is suggested to be normal value. The spontaneous "normalization" of ESA was not observed as appeared after the developmental dysplasia of hip (DDH) surgery. The post-operative complications such as re-dislocation, AVN ($p<0.0001$ $rs = -0.347$) and wind-blow deformity rate ($p<0.001$, $rs = 0.418$) were strongly related with decreased value of ESA.

Conclusion: In our research group, remodeling of femur proximal end was not observed as it is described in patients with DDH. The incorrect orientation of growth cartilage is strongly connected with worse final results.

SPLIT TIBIALIS ANTERIOR TENDON TRANSFER FOR THE CORRECTION OF EQUINO–VARUS DEFORMITY OF THE FOOT IN CHILDREN WITH CEREBRAL PALSY

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Introduction: Equino-varus deformity of the foot is one of the most common problems in children with cerebral palsy, especially those with spastic hemiplegia or monoplegia. The cause of the deformity is imbalance between anterior tibial and peroneus longus muscles. Split tibialis anterior tendon transfer (SPLATT) is one of the designed procedures to correct the deformity. The indications for SPLATT are: active function of tibialis anterior (TA) muscle, passively correctable hindfoot (Coleman block test). In some cases, when there is no active dorsiflexion by TA muscle, the surgery can be used to equalize the muscle balance around the foot. Contraindications include the fixed bone deformity and severe contraction of TA muscle.

Materials and methods: This is a retrospective study of 35 consecutive patients who underwent SPLATT procedure to correct equino-varus deformity of the foot at our institution form 2007 to 2011. Among the patients 29 had cerebral palsy (16 hemi – or monoplegia, 10 – diplegia and 3 – quadriplegia) and 6 patients were suffering from foot palsy. There were 18 boys and 17 girls. In 6 cases the surgery was performed bilaterally, so there were totally 41 operated feet. All patients were walking or potentially ambulatory children. The deformity was flexible in all cases. The mean age at the time of surgery was 12.6 years (from 7 to 31). In 20 feet the SPLATT procedure was combined with subcutaneous heel cord lengthening and in 8 feet the plantar fascia release was performed to correct the cavus deformity. The surgery was performed through 3 incisions: one over the dorso-medial part of the foot to harvest the tendon, the second one over the anterior surface of the distal tibia to split the tendon proximally and the third one over the cuboid bone laterally. It is crucial to pass the tendon subcutaneously to the third incision and fix it through the hole in cuboid tightly. We designed our technique to pass the suture and tendon underneath of cuboid bone to prevent the breakage of the lateral wall of the bone. The short leg cast was applied postoperatively for 6 weeks (2 weeks non-weight bearing and 4

weeks with weight bearing). After cast removal we used hinged type of AFO brace for 6 to 12 months.

Results: The mean follow-up for all patients was 3 years 1 month. Results were graded excellent or good in children who walk with less than 5° of varus, valgus, or equines posture of the hind foot, wearing regular shoes, having no callosities and were satisfied with the outcome. Feet with recurrent equino-varus deformity or overcorrected into a valgus or calcaneovalgus deformity were considered as poor results. Excellent and good results were achieved in 30 patients (85.7%). Among them there were 16 hemiplegic patients, 7 diplegic, 1 quadriplegic child and 6 patients with the foot palsy. Poor results were seen in 5 patients (14.3%): 3 diplegic and 2 quadriplegic.

Conclusion: Analysing the results we may conclude that SPLATT is an effective procedure which helps to restore the muscle balance around the foot and correct the deformity (in some cases gradually) and can be recommended as a treatment option for spastic varus deformity of the foot.

DEGA PELVIC OSTEOTOMY FOR THE TREATMENT OF ACETABULAR DYSPLASIA IN CHILDREN WITH CEREBRAL PALSY

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Introduction: Acetabular dysplasia and hip dislocation is a common problem in children with cerebral palsy, especially those with spastic quadriplegia. The treatment options include soft tissue releases or subtrochanteric varus producing, shortening and derotation osteotomy of the proximal femur combined with pelvic osteotomy to increase the femoral head coverage. The most commonly used pelvic osteotomies are re-directional ones, when there is cartilage-to-cartilage coverage (Salter, Steel, Ganz) or shelf augmentation types (Stahely). In 1969 Dega described the new type of pelvic osteotomy which change the direction and the shape of acetabulum.

Material: This retrospective study includes 23 children with cerebral palsy operated in our institution for spastic sub-luxation or dislocation from 2008 to 2011. There were 11 girls and 12 boys and the average age of the surgery was 7.3 years (from 3 to 13 years). In 6 patients the surgery was performed unilaterally, while in 17 – bilaterally, so there were totally 40 operated hip. In all cases Dega pelvic osteotomy was combined with open hip reduction, capsulorraphy and sub-trochanteric varus producing, shortening and derotation osteotomy of the proximal femur. Most of the patients had spastic quadriplegia (21) and only two children were with spastic diplegia. Dega pelvic osteotomy was performed through the Smith-Petersen approach and for the bone graft we used the bone after the shortening of the femur. In 4 cases when the bone from femur was very osteoporotic and small we used additional grafts from the iliac crest.

Results: The follow-up results were reviewed from all 23 patients with mean time of 13.8 months (from 6 moths to 26 months). In all cases the concentric reduction was achieved, but in 2 cases with severe asymmetric spasticity hip sub-luxation was developed 6–12 months after the surgery. The acetabular index (AI) improved from 36.1º (18º to 50º) to 21.2º (7º to 37º) at the last follow-up. There were 6 cases of mild avascular necrosis of the femoral head without any clinical signs. In 3 patients we observed the

massive ossification of soft tissues around the hip, which didn't affect the final results and required longer rehabilitation period.

Conclusion: Dega osteotomy has several advantages compare with other types of pelvic osteotomies: 1) it is easy, safe surgery and doesn't require internal fixation, 2) it provides good anterior and lateral coverage of the femoral head, 3) can be performed on both hips at the same time, 4) it change the shape and the size of the acetabulum, 5) can be used in children up to age of 11 – 13 years.

VERTICALIZATION OF THE CHILDREN WITH PROGRESSING HEREDITARY NEURO–MUSCULAR DISEASES WITH USE OF SURGICAL METHODS AND ORTHOTICS

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Urgency. Hereditary progressing neuromuscular pathology – a group of different, in some cases deadly diseases with different mechanisms of development.

Rehabilitation of disabled children with these diseases represents very difficult problem, caused by constant and very often progressing weakness and a dystonia of muscles of a trunk and extremities, first of all low limbs, and also increased and, as a rule, plural orthopedic deformations.

Till now neurologists and the medical geneticist, supervising such patients, recommend the active orthopedic methods for verticalization of the patient with watchfulness and often do not allows the surgical treatment and orthotics. At the same time, presence of progressing deformations of a backbone and extremities, weakness of the skeletal muscles, interfering a support and movement, cause necessity of participation of the orthopedist for rehabilitation of similar patients.

Material. Children's Clinic of St. Petersburg Albrecht Center for Occupational Expertise, Prosthetics and Rehabilitation have an experience of verticalization of 12 children with a proximal spinal muscular atrophy (2 type) and Disease Sharko-Mari-Tut (1 type) at the age from 2 till 16 years. The basic complaints of patients and their parents were the impossibility of a support and movement in connection with muscular weakness and presence of deformations of the low extremities and a backbone. The such more typical deformations of the low extremities, as paralytic incomplete dislocations of the hip, severe flexion deformations in the hip and knee joints, plano-valgus and varus deformations of feet of heavy degree were observed. Among deformations of a backbone most often the hyperlordosis and a progressing scoliosis of 2 – 4 degrees were observed. Children did not receive a regular orthopedic supervision and treatment before receipt in our clinic in 10 cases. In some cases the neurologists did not recommend to eliminate available deformations with surgical treatment use and to use the

orthotics for verticalization. The majority of invalids within more than 3th years were «wheelchair» patients.

Results and discussion. The basic orthopedic method of verticalization was individual atypical orthotic fitting, the most frequent orthoses were: orthopedic devices, splints, a textile or rigid corsets. In hard cases we made the individual orthopedic verticalization device, presented by orthopedic low extremity devices, connected with a rigid corset by locked joints. In the presence of a progressing scoliosis we used the Cheneau corset in this verticalization device. The 4 patents for inventions of the Russian Federation are received.

Surgical treatment represented an extreme measure and was applied to elimination only those deformations which didn't allow verticalization of the child even by orthoses use: severe flexion deformation of hip and knee joints, varus deformation of the feet. Such deformations as incomplete dislocations of the hip and plano-valgus deformation of feet, weren't obligatory for surgical correction because didn't interfere to verticalization and could be fixed during orthotic fitting.

There was successful verticalization and movement training in all patients.

CHILDREN'S CEREBRAL PALSY: PRINCIPLES OF CHILDREN ORTHOTICS WITH SPASTIC DIPLEGIA

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Urgency. Spastic diplegia – one of the most widespread forms of a children's cerebral palsy, which the most often lead to impossibility of independent support and movement. The constant spasticity of muscles leads to development of such deformations of the low extremities, as abductional and flexion contractures of the hip joints, decentration or paralytic incomplete dislocation or full dislocation of the hip, flexion or (less often) hyperextension deformation in knee joints, equinus, an equino-plano-varus or equino-plano-valgus deformations of the feet of various levels of severity. This deformations complicate or make impossible the patients support and movement. In the same cases, when patients are capable to stand or go on the deformed extremities, level of deformations can rise. The aforesaid causes importance of orthopedic control at all stages of rehabilitation and necessity of wide application of different kind of orthotics for treatment of such patients.

Materials. For the last 5 years in Children's Clinic of St. Petersburg Albrecht Center for Occupational Expertise, Prosthetics and Rehabilitation more than 497 patients at the age from 2 till 15 years with a children's cerebral palsy were treated. 449 children were hospitalized with diagnosis «spastic diplegia» or «spastic tetraparesis». The basic features were decussation of low limbs and flexion contracture of hip joints, flexion position or rigid deformation in knee joints, impossibility of a support on a heel, impossibility of independent support and movement and, quite often, impossibility of any support and movement owing to heavy deformations.

Results and discussion. Rehabilitation of such patients always was complex and included well known conservative and surgical methods and always individual orthotics at all stages of treatment. The most widespread types of orthoses were orthopedic footwear, splints, textile thoracolumbar corset. Also we used such more functional and technically difficult orthopedic means, as orthopedic low extremity devices and individual orthopedic vertilization devices, which are represented by orthopedic low extremity devices and rigid corset, connected which each other by metal hip joints.

The advantage of orthopedic devices using is possibility of a choice of their functionality depending on a patient′s state. So, in the case of expressed decentration or an incomplete dislocation of the hip verticalization devices were supplied with metal joints with lumbar splints and the basic platform in the field of ishciatic tubers for maintenance of unloading of joints and prevention further lateralization of the hip. At a stable hip joint and internal rotation of low extremities during support and movement these devices were supplemented by derotation belt, allowing to deduce the low extremities in average position without function restriction. At flexional installations in knee joints and impossibility of independent full extension we established knee hinges with lock elements whereas at sufficient function extensors of femur or at hyperextensional position in knee joints the restriction of mobility of knee hinges was inexpedient.

Individual orthotics in all cases provided improvement of functionality of patients.

THE CEREBRAL AND SPINAL PALSY: OPTIONS FOR SPASTICITY

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It should be noted that all patients cerebral paresis are similar, as in all there are two main trait of his – paresis and spasticity. However, there is much variation due to the localization of the source, nature and characteristics of a damaging factor during the main pathological process. In this respect, revealing patients with cerebral and spinal spastic paresis, which have a similar distribution of tonic disturbances in the affected limbs, but various changes in posture and gait character.

Thus, the typical posture of patients with spastic paresis, which developed as a result of stroke, traumatic brain injury and other brain diseases. In this case the patient's arm is bent at the elbow joint is reduced, straighten the leg, foot plantar flexion in position and supination. This unique position is due to the uneven distribution of muscle hypertonia on specific muscle groups. There are also, various deviations from the classical type of distribution of spasticity, hypertension is prevalent when the muscle is not listed in the muscles and their antagonists. Sometimes this is a deviation from the usual type seen on only one muscle group, in other cases – in respect of two or more muscle groups.

For the first time after the onset of paresis of the intensity of spasticity varies. The weakening of muscular hypertension observed at rest, during sleep, the action of heat; gain – at work, walking, from the action of cold, when tapped on the muscle, excitement, fear, anger. Gradually, spasticity becomes more stable and fixed. Parallel to the development of spasticity in many patients appear and then become more pronounced comovement – synkineses different kind, more global. As a rule, increased tendon reflexes and pathological reflexes occur. Predominant type of increased muscle tone is spastic paresis, although some may experience muscle stiffness and signs, and then it is a mixed type of muscular hypertension.

As part of the cerebral motor disorders isolated cortical monoparesis and hemiparesis due to damage to the motor cortex (injury, lacunar stroke). Thus, in the event of damage to 4 fields, there is hemiparesis with minimal disruption of muscle tone, in contrast, the localization of the pathological

process at 6 field, there is a structurally unstable hemiparesis with severe spasticity.

Clinical manifestations of spastic paresis depend not only on the level of destruction of descending motor pathways (spinal or cerebral), but the nature of the disease. In this syndrome can be specified as a consequence of the interruption of fibers of motor systems (brain injury, stroke) or compression (tumors), and the result of demyelinating process (relapsing-remittent course of multiple sclerosis), axonal degeneration (amyotrophic lateral sclerosis, spastic lower paraplegia) and a combination of the latter two processes (progressive course of multiple sclerosis).

THE PROBLEMS AND PROSPECTS OF REHABILITATION IN CEREBRAL SPASTIC PALSY

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Among the factors contributing to neurological disability of patients are the most important motor disorders, the main clinical manifestation of which is spastic cerebral palsy. Spasticity is revealed in the study of passive movements of the limbs as increased resistance to muscle in response to its rapid expansion. For spasticity is characterized at the initial stage of investigation, the stronger the resistance, which greatly diminishes with continued motion.

For the correction of muscle tone is mainly used antispastic drugs. In general, taking antispastic medications only in some patients improves motor function and often have patients walking even leads to a temporary deterioration of standing and walking as spastic muscles of the extremities have an important support function in walking.

Injection of ethanol or phenol in spastic muscle allows rapid and sustained effect in reducing the increased muscle tone. This is a relatively cheap method of treatment. However, the injection is painful, after that there is permanent damage to muscle tissue, often have side effects: chronic pain, local changes in muscle and vascular reactions.

In recent years, the treatment of spastic cerebral palsy, drugs have been used botulinum neurotoxin type A. In comparison with existing methods of treatment of muscle spasticity, the local administration of botulinum toxin has several obvious advantages. First, the treatment was well tolerated and not associated with the risk of serious complications. Second, you can select one or more muscles for injection, and dosage of the drug, providing the desired degree of relaxation. The widespread use botulinum therapy in spasticity is largely confined to the high cost of the drug. However, a study conducted in Germany «Therapie der spastischen Syndroms» on the effectiveness of three treatment options for cerebral palsy: physical therapy, physical therapy and botulinum therapy, baclofen and physical therapy – showed that the reduction of spasticity with botulinum toxin combination of physical therapy and was three times greater than when using baclofen and physical therapy, and ten times more than with a physical therapy.

Evaluation index of cost-effectiveness of the treatment of cerebral spasticity was lower with the use of botulinum toxin, and physical therapy than with other methods of treatment.

However, in all cases after botulinum therapy require active physical therapy. Botulinum therapy not a substitute for physical therapy, and is an integral part of Physical Medicine and Rehabilitation.

A significant number of issues associated with the use of botulinum toxin in spasticity requires further study. First of all, safely and effectively if the use of large doses of botulinum toxin, which is often necessary in severe spasticity in cerebral paresis? Second, in what time frame the appearance of spasticity should be botulinum therapy? Third, what combination of rehabilitation and botulinum therapy is optimal?

Thus, a variety of clinical manifestations of spasticity, lack of effectiveness of currently used methods of treatment, obliges us to improve the previously proposed and the search for new methods of rehabilitation treatment of this disease.

WHAT IS IT – CEREBRAL PALSY OR METABOLIC DISEASES?

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Background: Cerebral palsy (CP) of children is wide spread, and it is found due to various reasons as it is static brain pathology. American Academy of Neurologists advised to provide genetic and metabolic tests during the checkup of the normal imaging patients and the patients with the atypical features besides anamnesis. The neurological manifestations of inherited-metabolic diseases are chronic encephalopathy, acute encephalopathy, stroke, motor disorders (ataxia, choreoathetosis, dystonia, parkinsonism), myopathy, mental and behavior disorders. Development delay is the most frequent manifestation of genetic and metabolic diseases. (J.T.R Clarke 2005)

In this investigation, in the children's neurological hospital of Baku, it was observed the possibility of metabolic disturbance of the patients with CP diagnosis and the features of metabolic disturbance were investigated.

Methods. Since 2006, within 3 years, the history of 1450 patients with CP diagnosis applied to the Baku Children's Neurological Hospital was investigated retrospectively. 916 (63.2%) were males (m) patients and 534 (36.8%) were females (f) patients.

To verify the diagnosis was carried out questioning the parents, clinical examination and standard instrumental examination of patients. Brain CT/MRI was done for 101 patients among those ones.

Results. According to the classification of ICD-10 there were 824 patients (56.8%) of tetraplegic type; 238 (16.4%) of diplegic type, 158 (10.9%) of hemiplegic type; 52 (3.6%) of diskinetic-hyperkinetic type; 6 (0.4%) of atactic type; other types – atonic-astatic, mix type – 107 (7.4%); non-specified types were 65 (4.5%).

In 12.87% of the patients (10 m and 3 f), held brain CT/MRI abnormality was not found. The metabolic tests were done in two patients suspected of having metabolic disturbances basing on their clinical presentation. In 2 of these patients were diagnosed Gaucher type 2 (f of 2 year 3 months, who was treated by CP tetraplegic type, the condition of whom was getting from bad to worse) and histidinemia (m of 2 year 5 months treated with CP type non-specified and relatively lost of acquired skills patient).

The number of metabolic diseases among these patients may be adopted as 2/1450 or 1.3/1000 but as the result of not providing screening of metabolic disease during the birth this number may be much higher.

Conclusion. If CT and MRI results of patients with CP disease are normal the following circumstances should be taken into the consideration: relation ties between parents, the recurring respiratory problems, chronic gastro-intestinal, digestive disorder, hepatosplenomegaly, inexplicable anemia, the development of backwardness, tonus changes, loss of acquired skills, in these cases, a family-like illness should be considered in cases of metabolic disease.

THE ROLE OF VESTIBULAR APPARATUS IN SPASTICITY DEVELOPMENT IN PATHOLOGY OF THE NERVOUS SYSTEM IN HUMANS

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Spasticity is a consequence of loss of pyramidal corticospinal influences in the regulation of muscle tone. The process is carried out at the level of the segmental apparatus of the spinal cord. The function of the pyramidal tracts is in an activation of flexor muscle group. Descending vestibulospinal path activates the extensor muscle group. Consequently, the corticospinal and vestibulospinal effects on muscle tone are in an antagonistic relationship. There are two objectives in a present work: 1. The study of vestibular influences on spasticity. 2. The proof of possibility of acting on the vestibular apparatus in in order to reduce spasticity.

The study was conducted on 29 patients with spasticity in the limbs. The study involved 19 male and 10 female patients. Age of patients was ranged from 5 to 35 years. 7 patients with younger age groups (5 – 10 years) were diagnosed with cerebral palsy (CP). 2 patients in the oldest age group (persons above 18 years) had the same diagnosis. These 9 patients had spastic tetraparesis. 20 patients had spastic tetraparesis or hemiparesis due to brain injury. Spasticity was assessed by Ashworth's scale. Its average value over the entire group was 3.43 points. In addition, patients were undergone electromyography and myotonometriya.

We studied the effect of the vestibular apparatus on spasticity in our proposed otolithic test (OT). The essence of the test is that the patient on a platform equipped with detent stop moving in the sagittal plane from a vertical position (orthostasis) trough a horizontal position (klinostazis) in head-down position (antiortostazis – AOS). During the test, muscle tone's spasticity with patients in a "head down" position at an angle of 30–45° regresses to 2,3 points on a Ashworth's scale ($p<0,05$). When electromyography in the AOS determined a clear tendency to normalization of the pathologically altered patterns of bioelectric muscle's activity, while during myotonometrya there was a significant reduction ($p<0,05$) of pathologically increased muscle's tone.

Our results allow to suggest a vestibular deretseption (VDR) in the capacity of a therapeutic effect. This impact is accomplished by the unilateral

intratimpanal imposition of gentamicin having vestibulotoxic effect. Under the option, the introduction of an antibiotic enters the endolymph and vestibular membranes by diffusion through the round and oval windows and acts primarily on the otolithic apparatus of the labyrinth, without affecting the function of hearing. The course of treatment consisted of 4–5 actions which were carried out at intervals of 2–3 days. It takes about 10–14 days. The achieved results are consistent with the results of OT.

Conclusions:

1.Proved a significant influence of the vestibular apparatus on the development of spasticity.

2. Decrease in activity of the vestibular apparatus has medicinal value and significantly reduces the severity of spasticity.

RESEARCH INTO THE INFLUENCE OF BOTULOTOXINUM (TYPE A) ON CHILD'S CEREBRAL BLOOD FLOW WITH SPASTIC FORMS OF CHILDREN CEREBRAL PALSY

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This current research aims to study new perspective sides of the botulotoxinum type A drug in the aspects of hemocorrection effect.

Treatment and social adaptation of children who are diagnosed with cerebral palsy is the major task for the municipal consulting room established at Municipal Children's Polyclinic # 1, Krasnodar, in 2006. Botulinotherapy is one of the important areas of research being carried out at the consulting room. Over the entire period of the study, botulinotherapy was administered to 342 patients. In 2011, thirty-eight (38) children from 3 to 16 years of age received botulinptoxinum type A (BTA) treatment. Positive clinical dynamics in the form of reduced muscle tone, increase in the range of motions, the possibility of correction of the pathological locomotive pattern was observed in all the children. We wish to particularly note the improvement of the cognitive functions of the child patients who have undergone the botulinotherapy course.

In this regard, we have carried out an ultrasound examination of the vessels in the extra – and intracranial parts of the brain of 21 patients who received the BTA injections.

In evaluating the vessels hemodynamics we oriented ourselves toward the color signal visualization, the vessel diameter in the extracranial parts, the shape of the Doppler curve, the blood flow speed characteristics, the flow symmetry, and the estimated blood flow indices.

Analyzing the results of the BTA therapeutic application in the vessels of the carotid and vertebrobasilar pool of the extra – and intracranial parts of the brain, one can note the points as follows:

In the intracranial section prior to the treatment an increase was noted in the resistance index in the majority of the vessels of the carotid and vertebrobasilar basins up to 0,68 – 0,70, versus a normal rate of 0.50 – 0.60. Linear velocities of the blood flow in most vessels have been reduced or abnormally increased. Asymmetry of the blood flow in the similar segments of the paired vessels in individual patients reached 55 – 60%. Two (2) weeks

after the injections, the resistance index was normalized in most of the vessels, and in the rest decreased. The linear blood flow velocities leveled off. The blood flow asymmetry in the paired vessels diminished.

In the extracranial part, before the injections, in the patients with an increased tone of the cervical muscles and shoulder girdle the signs of deviation of the route of the common carotid artery, common jugular vein, sometimes with a change – increase of its diameter, were noted. In the majority of the patients, deviation of the route of the vertebral arteries in the spinal canal, a high-level entry of the vertebral arteries into the V2 segment were detected. The linear velocities of the blood flow tended to decrease, the blood flow asymmetry in the paired vessels came up to 60%, RI mosaically changed.

After the BTA injections, deviation of the course of the vessels decreased, the diameter of the internal jugular vein decreased, having approached to normal. The linear flow velocities increased, the blood flow asymmetry in the paired vessels decreased.

This study allows to come to the two **conclusions:**

1. Spastic children cerebral palsy (CCP) forms having at its core an organic lesion of the central nervous system, are accompanied by changes in hemodynamics of the cerebral vessels.

2. Botulonotherapy is accompanied by a steady positive hemodynamic effect at the level of the upper and lower extremities blood vessels, and at the level of the cerebral vessels in the extra – and intracranial sections.

RESEARCH INTO THE INFLUENCE OF BOTULOTOXINUM (TYPE A) ON THE PERIPHERAL BLOOD FLOW IN CHILDREN WITH SPASTIC FORMS OF CHILDREN CEREBRAL PALSY

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For the local treatment of central pareses, botullinotoxinum type A therapy is currently available to child patients.

Botulinotheraphy is one of the important areas of the consulting room activities under way. Positive clinical dynamics in the form of reduced muscle tone, increase in the range of motions, the possibility of correction of the pathological pattern of movements are observed in all the children.

After the vascular ultrasound examination of the vessels in 18 patients who received injections of BTA, improvement was observed in the arterial blood flow of the patients' upper and lower extremities. In the course of this study, we examined the patients' blood flow applying color duplex sonography (CDS). The research was conducted using the Philips HD11 linear sensors, their frequency rate being 7 – 10 MHz.

The group of study patients included the following forms of spastic cerebral palsy cases: spastic diplegy – 5 persons, spastic diplegy, mainly affecting the right-side extremities – 2 persons, spastic diplegy, mainly affecting the left-side extremities – 7 persons, children cerebral palsy syndrome (CCPS) in the form of left-side spastic hemiparesis against the background of genetic pathology – 1 person., spastic tetraparesis, mainly affecting the upper extremities – 3 persons.

Several areas were determined a survey of which allows us to differentiate pathological changes. Lower extremity – the common femoral artery, superficial and deep femoral arteries, popliteal artery, posterior tibial artery, dorsal artery of foot. Upper extremity – proximal part of the brachial artery, the distal portion of the radial artery.

In evaluating the hemodynamics of the peripheral vessels, we oriented ourselves to visualization of the vessel (DRC, ENERGY DOPPLER), diameter, shape of the Doppler curve, velocity characteristics of the blood flow, blood flow symmetry, evenness of the speed reduction from the center to periphery, estimated blood flow indices.

Normally, at all levels there should be main extremity blood flow, with a 10% segmentwise speed reduction, increase in peripheral resistance indeces from proximal to distal sections, left- and right-side asymmetry, velocity – and indexwise, in identical segments being 10% at most.

The following presentations were observed in our patients before the BTA injections: left- and right-side asymmetry of more than 10%, reduction in the peripheral resistance indeces in the spastic extremities, blood flow linear velocity (BFLV) decreased in the spastic extremities per segment by over 10% with peripheral resistance idex (PRI) reduction from the center to periphery; in the event of severe spasticity, the blood flow by means of color duplex sonography (CDS) was not determined.

Two (2) weeks after the injections were made, there was an all-parameter blood flow improvement noted in the patients. During the ultrasound examination carried out 6–8 months later, the positive hemodynamic effect as compared with the previous studies was lower, but it did not disappear completely.

This research allows us to arrive at the two **conclusions:**

1. Spastic children cerebral palsy (CCH) forms are accompanied by changes in hemodynamics of the peripheral vessels as a result of a protracted increase in the tone of individual muscle groups in the form of persistent or transient increased peripheral resistance syndromes.

2. Botulinotherapy is accompanied by a steady positive hemodynamic effect.

MULTILEVEL MINIMALLY–INVASIVE APPROACH FOR PREVENTION OF DEVELOPMENTAL DYSPLASIA AND DISLOCATION OF THE SPASTIC HIP

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Background: Hip disorders are common in patients with cerebral palsy and cover a wide clinical spectrum, from the hip at risk to subluxation, dislocation, and dislocation with degeneration and pain. Although the hip is normal at birth, a combination of muscle imbalance and bony deformity leads to progressive dysplasia. The spasticity or retraction usually involves all the muscle around the hip joint ever to a different extent. Many patients with untreated dislocations develop pain by early adulthood. The MMA approach (Multilevel Minimally-invasive Approach) has been designed to restore muscle balance, mechanical stress up on the hip joint and prevent femoral head migration and bone deformities thereby avoiding future pain with minimal biological cost to the patient.

Treatment consists of:

M.M.A. 1: RI ≤ 20%: multilevel injection of botulinum toxin in case of muscular hyperactivity without morphological alterations of the couple muscle-tendon (contractures)

M.M.A. 2: RI ≥ 20%: multilevel aponeurectomies in case of muscular hyperactivity with morphological alterations of the couple muscle-tendon (retraction)

M.M.A. 3: MMA 2 associated to early bone surgery (proximal femoral temporary epiphysiorisis with cannulated screw to achieve a progressive correction of valgus deformity).

Methods: This retrospective study included all patients surgically treated from 2004 to 2010 with cerebral palsy. There were 300 patient (average of age 4–16) subdivision for MMA1(n° = 132; 57 female, 75 male; female mean age 9.86, male mean age 8.26), MMA2 (n° = 131; 45 female, 86 male; female mean age 10.76, male mean age 11.27) MMA3 (n° = 37; 17 female, 20 male; female mean age 10.29, male mean age 9.2). The management were different based on Reimer index and acetabular index. Patients were evaluated with the same parameters after an average of eight

months postoperatively and after one year. The mean follow-up was 5 years. The pre- and postoperative results were statistically compared

Result: Fifteen male patients switched from MMA1 to MM2, three patient repeated the treatment twice MMA1 and one repeated twice MMA2; seven female switched from MMA1 to MM2, four patients repeated the treatment twice MMA1 and two patients repeated twice MMA2; only one patient female switch from MMA1 to MMA3; only two patient male switch from MMA2 to MMA3. Results showed that only 4 male patient and 2 female after treatment MMA to needed futher major surgery for hip dislocation.

Conclusion: The results show the possible prevention of hip subluxation progressive. They also show that the early this approach is applied the better results avoiding mayor reconstructive surgery, give the cerebral palsy child significant improved their quality of life and was associated with a high level of parents'/guardians' satisfaction.

THE USE OF THE SURFACE EMG FOR THE ASSESSMENT OF BOTULINUM TOXIN TYPE A TREATMENT IN CHILDREN WITH SPASTIC FORMS OF CEREBRAL PALSY

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Objective. The botulinum toxin type A (BTA) injections is widely used to reduce spasticity in children with cerebral palsy (CP). The limitations of the maximum BTA dosage per session make a careful selection of the exact muscles for treatment to be an important part of the whole rehabilitation program. EMG is an informative method for studying of the peripheral neuromuscular system and in patients with CP allows to determine the nature and extent of pathophysiological muscle tone changes. At the same time together with clinical changes EMG helps to assess the treatment efficacy objectively.

Design. The study included 96 patients with CP, aged 2 to 9 years: 77 children with spastic diplegia and 19 children with hemiplegic form. For correction of gait and pacing movements depending on the prevailing pathological syndrome the BTA injections were performed mainly into hip adductors muscles (m. adductors magnus and/or m. adductor longus), medial and lateral heads of m. gasrocnemius. In some cases the injections were made into m. soleus and m. tibialis posterior.

Results. The degree of spasticity assessed with Modified Ashworth Scale was significantly reduced after BTA treatment. The severity of equinus strains decreased. The angle of passive extension and ankle joint mobility during passive extension in the supine position with legs straight and in upright position become more pronounced. This gave the background for the formation of the step support reaction and reciprocal movements. The best clinical results with BTA treatment were obtained in children with a local or regional distribution of the EMG activity in muscles at rest; in cases with minimal pathological EMG synkinetic activity when performing voluntary movements (synergistic activity coefficient was not more than 0,5); the disturbance of coordinated action between synergists and antagonists muscles was moderately expressed (reciprocity coefficient was not higher than 0,4); the amplitude of EMG signal was not lower 150 uV in voluntary contraction.

Conclusion. The EMG analysis of voluntary muscle contraction in patients with spastic CP is an easy and time saving method of the BTA treatment assessment in CP patients with gait disturbances.

ELCAR IN THE THERAPY OF ABNORMALITIES OF NEUROLOGIC–AND–BEHAVIORAL DEVELOPMENT OF CHILDREN WITH THE RESULTS OF PERINATAL DEFEATS OF THE CENTRAL NERVOUS SYSTEM

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It is known, that patients with the perinatal defeat of the nervous system in past history have the disfunction of energy system of the brain. It is shown by the disfunction of different areas of neuropsychic activity (motional, vegetative, emotional, cognitive). Consequently, the increase of brain energy potential is one of the tasks of pathogenetic therapy of children development abnormalities with the results of perinatal defeat of nervous system. That's why it is necessary to use metabolic active energotropic substances.

The research objective point was the dynamics' definition of clinical and functional development indicators of 20 children, suffering from infantile cerebral paralysis, who take elcar (20% solution of L – carnitine) in the complex therapy. The age of children was from 1 to 7 years. This medicine was prescribed in an average age doses with the duration of treatment for 1,5 – 2 months. The basic method of analysis was the assessment of clinical and electroencephalographic datum. Physical examination included studying of anamnesis, complaints, and the studying of neurologic status also. EEG-analysis was made with the help of 16-channel computer encephalograph with the analysis of quiet wakeful state and functional loads' information. Characteristics of the basic cortical rhythms, zonal distinctions, degree and localization of irritative processes, presence and intensity of pathological kinds of activity, nature of the functional loads' reactions were studied.

Results of the research were the following: positive effect of elcar was marked from the second week of taking the medicine. In all cases, changes in the impellent sphere were found: children with spastic forms of paralysis had a reduction of muscular tonus, indicators of motor development of children even with heavy degree of a pathology improved. In the case of atonic forms the muscular tone has raised. Patients with an infantile cerebral paralysis increased tolerance for physical activities that facilitated walking and raised impellent activity. Positive dynamics was more appreciable with the long taking of elcar. Static and dynamic characteristics of pose and walking, vocal muscular work became better. EEG

has shown positive dynamics with 17 children: irritative processes became smaller, the threshold of readiness for convulsions raised, indicators of cortical electrogenesis became better (the amplitude has raised and the index of capacity of biopotentials has increased.)

During the research the efficiency and expediency of elcar usage in complex therapy of children with infantile cerebral paralysis is defined. Combination of metabolic and neuromodular properties allow to recommend Elcar in use for children with the results of perinatal defeats of the central nervous system.

COMPARISON OF RESULTS OF SURGICAL TREATMENT OF NEUROLOGICAL HIPS IN CHILDREN BY TWO TYPES OF LOCKING PLATES BASED ON THE SERIES OF 25 PATIENTS AND 45 HIPS

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Introduction. The hip reconstruction surgery in cerebral palsy (CP) includes a varisation-derotation osteotomy in proximal femur associated with acetabuloplasty. The aim of this study is to compare results of two locking plates in the multilevel surgery in CP children.

Materials and methods. We performed a prospective study of 25 patients (GMFCS level III, IV and V) aged from 3 to 13 years old. The patients were divided into two groups according to the type of applied plate, patients were chosen at random. Group A (Synthes® LCP Pediatric Hip Plate 100° or 110°) included 12 patients (22 hips) of an average age 6.2±0.66 years, an average weight 17.5±1.49 kg. Group B (Surfix®, vis-plaque à 90°) included 13 patients (23 hips) of an average age 6.1±0.67 years, an average weight 16.2±1.07 kg. Seven acetabuloplasties and two Salter osteotomies were performed in Group A, and 15 acetabuloplasties in Group B. The surgery was bilateral in 19 patients within an interval of 2 to 4 weeks.

The anteroposterior radiographs of the pelvis were obtained considering the hip and knee flexion contracture and in neutral hip rotation (patella facing forward). Duration of the intervention, blood loss, radiographic results of a short term follow-up (4 to 6 months) were compared.

Results. We have not found any difference in radiographic results.

Group A: Reimers 5±1.5% (53.6±7.3% initially), Wiberg 24.1±1.4º, neck shaft angle 123.5±1.9º (160±3.2º initially), acetabular index 19.2±1.2º (29.1±1.7º initially).

Group B: Reimers 2±0.9% (53.8±6.1% initially), Wiberg 25.1±0.9º, neck shaft angle 117.7±1.2º (162.5±2.5º initially), acetabular index 18.7±0.9º (28.7±1.6º initially).

The mean duration of the intervention is more dramatic in Group A: 172±9 min against 141 ±12 min.

The blood loss is more important in Group A: 165.6±20.3 ml, number of erythrocytes 3.3±0.2 T/L (4.6±0.1 T/L initially), hemoglobin level 9.1±0.4 g/dl (12.5±0.3 g/dl initially), than in Group B: blood loss 145±12.8 ml, number of erythrocytes 3.6±0.1 T/L (4.5±0.1 T/L initially), hemoglobin level 9.5±0.4 g/dl (12.9±0.3 g/dl initially).

We noted one case of femoral head necrosis in Group A, but neither delay of consolidation nor secondary displacement in both groups.

Discussion and conclusion. These two materials remain reference in hip surgery in CP children (Gicquel et al, Morin 2009). Their advantage is a reliable anchorage adapted to the porotic bone. The both methods assure an accurate, stable, reproducible and reliable correction.

The plates of Group B (Surfix®) seem more easy and fast to use in such fragile patients.

THE EFFECT ON THE WALKING ABILITY OF INTRATHECAL BACLOFEN THERAPY IN CHILDREN WITH SPASTIC CEREBRAL PALSY: A SYSTEMATIC REVIEW

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Aim: Intrathecal baclofen (ITB) has shown to decrease severe spasticity in children and adolescents with spastic cerebral palsy. The aim of this systematic review is to reveal whether scientific evidence is available for the use of ITB to improve the walking abilities of children and adolescents with spastic cerebral palsy.

Method: Electronic databases were searched for articles published between 1985 and July 2011 using combined subject headings, free text if supported by the databases, and citation tracking. Search terms were spasticity AND baclofen AND (walking OR gross motor function OR gait).

Studies were included if they met the following criteria: (1) the studies involved children with spastic cerebral palsy (age of 4 to 18 years) with GMFCS I–IV, (2) the study explored the relation between the administrating of ITB and the walking abilities of the participants, (3) the studies were in English.

Results: Nine studies met all the inclusion criteria. They had a low level of evidence and heterogeneous methodological quality. The follow-up period in the studies varied from 3 months to 5 years. Most participants showed improvement in walking abilities after the use of intrathecal baclofen. Adverse events were common.

Conclusion: The use of ITB in children with GMFCS I–IV seems to have a positive effect on their walking ability. Further studies with a higher level of evidence are needed. For starters a nation wide retrospective study in the Netherlands. After this study, a study with a higher level of evidence is recommended, such as a prospective, randomized controlled, placebo-controlled trial.

METABOLIC THERAPY OF EPILEPSY

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Side effects of medicamental therapy of epilepsy are well known. The metabolic therapy is able: 1) to prevent the toxic component of the medicamental therapy; 2) to potentiate its anticonvulsant effect; 3) to carry out the pathogenetically substantiated anticonvulsant therapy (in deficit of taurine or pyridoxal phosphate, in particular); 4) to maintain the minimal therapeutic doses in monotherapy and to carry out selection of an anticonvulsant drug without exacerbation; 5) to support synthesis and release of the inhibitory transmitters: GABA, Gly, Tau; 6) to prevent the oxidant stress and hyperhomocysteinemia; 7) to normalize the mitochondria functions with the aid of the tissue respiration correctors; 8) to perform the orthomolecular therapy of most concomitant diseases (vitamin-, taurine-, phyto-, diet therapies make up for the functions of the liver, kidneys, gastrointestinal tract, cardiovascular system) [1,2].

The objective and material of the study. Study of the metabolic therapy in 128 patients with epilepsy aged 6 to 70 (children and adolescents – 32, adults – 96). The clinical picture: tonic-clonic and clonic paroxysms, absentia epileptica, the rate of seizures being 2 per year to 20 per day. By the moment of the start of the study, 75% of the patients were taking 2 or 3 preparations, 23% – 3–4 preparations without positive clinical effect and with manifestations of drug intoxication. Observation and treatment (4 or 5 courses a year) were performed during 2 years at the outpatient clinic.

The received therapy: antioxidant – alpha-tocopherol 100 to 300 mg and up to 600 mg per 24 hours intramuscularly during 2 or 3 weeks (excessive administration diminish the antioxidant effect); vitamin A – 100 000–300 000 IU per 24 hours per os for 1 or 2 months (in larger doses and regular administration, toxic manifestations are probable in the liver); vitamin C – 300–500 mg per os 2 times a day for 1 or 2 months (in larger doses, a pro-oxidant effect is possible); selenium – 20 to 200 mg per 24 hours intramuscularly, or SELENIUM-ACTIVE (50 mg of selenium) per os once a day during one months in case of obvious selenium deficit (usually the selenium-containing food).

Therapy of hyperhomocysteinemia – activation of enzymes catabolising the homocystein: 1) by means of transsulfuration to cystathio-

nine (vitamin B6 – 40–80 mg of pyridoxal phosphate 2 to 4 times a day for 1 or 2 months; this cofactor is also necessary for synthesis of GABA and Tau); 2) by means of remethylation to methionine with the aid of methionine synthase – vitamin B 12 intramuscularly in doses of 100 μg every other day during 1 or 2 months (in intramuscular administration, it is incompatible with solutions of vitamins B6, B1, C); 3) by means of remethylation to methionine with the aid of methylenetetrahydrofolate reductase (under the control of the blood coagulation) – folic acid 100–200 to 400 μg a day per os during 1 or 2 months simultaneously with vitamins B12 and B6. Homocysteine and mercaptans – the methionine derivatives, introduce a considerable contribution to initiating of hepatic encephalopathy, therefore use of methionine in epilepsy is contraindicated.

Taurine therapy – in doses of 400 mg 1 or 2 times a day for 2 months per os after meal (ORTHO-TAURINE-ERGO).

Phyto-tea, including fruit of Rose cinnamomia, Sorbus aucuparia, Rubus caesius, Hippopheae, Valeriana officinalis root, Leonurus cardiaca, Marticaria chamomilla.

The diet included young stalks, petioles and rhizomes of Archangelica officinalis, Urtica dioica, Aronia melanocarpa, oleum Hippopheae (under the control of the blood coagulation) [2]. In duct cholestasis, ursodeoxycholic acid per os in the dose of 250 mg 2 to 4 times a day was prescribed until complete resolution. In order to decrease formation of ammonia in intestine: control of protein consumption (up to 1 g per 1 kg body weight). Energy maintenance on account of easily assimilated phytogenous carbohydrates. Lactulose decreasing the medium pH in the intestine and thus suppressing the ammonium-genic bacteria, decreasing absorption of ammonia (under the control of the blood electrolytes).

The results: in 30% of the patients, the seizures stopped for a prolonged period, in 50% of the patients who had been resistant against the anticonvulsant therapy, the seizure rate decreased 2 – to 4-fold; practically in all the patients to whom the enhanced doses of anticonvulsant preparations had been prescribed, these doses were decreased; the polypragmasy was essentially diminished (1 preparation is taken by 38%, two preparations – 45%, and 3 patients receive the metabolic therapy alone). Parallel to elimination of the symptoms of drug intoxication and decrease of the seizure rate, the neuro-mental condition of the patients also improved: their aggression lowered, their sleep improved; in the EEG, changes towards

normalizing appeared, the EEG epileptiform manifestations diffuseness decreased (in a number of cases, the focal nature became apparent), the patients' social-labour adaptation became enhanced.

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MUSCLE ULTRASOUND FOR DIFFERENTIAL DIAGNOSTIC NEUROMUSCULAR DISORDERS

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Background: Muscle ultrasound is available and noninvasive method for detection muscles atrophy, intramuscular fibrosis, fatty infiltration and fasciculations. Amyotrophic lateral sclerosis (ALS) and spinal muscular atrophy (SMA) – is a progressive neurodegenerative diseases characterized by progressive muscular weakness due to cerebral and/or spinal motoneurons death. Fasciculations is very sensitive sign for the progressive low motoneuron diseases.

Purpose: To study muscle ultrasound ALS and SMA patients.

Methods: We observed 42 patients with sporadic ALS (mean age 54,3±10,2; mean duration of the disease 9,2±3 months) and 12 SMA patients (mean age 41,1±9,6; mean duration of the disease 6,2±3 years). All patients were examined by clinical, electrophysiologic examination (needle electromyography, motor and sensory nerve conduction studies) and muscles ultrasound. We used ultrasound for fasciculations detection in key muscles of cervical and lumbasacral spinal cord segments according to the International Standards for Neurological and Functional Classification of Spinal Cord Injury. In addition we investigated thoracic segments by ultrasound of paraspinal muscles and rectus muscle of abdomen and caudal part of brainsteam by ultrasound of tongue and masticatory muscles.

Results: Fasciculations were found in 57,1% patients with definite sporadic ALS (only 40% of them had fasciculations at least on 3 levels) and 12,3% SMA patients by visual control during clinical examination. At the same time ultrasound revealed fasciculation's at least on 3 levels in all patients with ALS. In SMA patients ultrasound showed an inhomogeneous increase of echo intensity with severe atrophy but fasciculation's were found only in 27,1% that may be associated with slower progression then ALS.

Conclusions: This study reviews the possibilities and limitations of ultrasound in muscle imaging and its value as a diagnostic tool in neuromuscular disorders. The results of ultrasound data conform to electrophysiologic examination in relation to involvement spinal cord segments in the pathologic process. We recommend ultrasound fasciculations diagnostics as an additional method for screening early ALS stage.

EXPERIENCE OF TACKLING CHILD DISABILITY

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Introduction: Mission East, Danish international relief and development organization has extensively assisted Armenia since 1992. Prevention of disability in children along with other major issues has become the focus of the humanitarian projects implemented by the organization. "Arabkir" JMC&ICAH joined "Healthy Start" project as a partner and was responsible for the health component. 2008 – 20011 periods covered two regions/marzes of Armenia.

Aim: Early identification of developmental disorders among children and provision of medical and early intervention services for child disability prevention.

Material and Methods: The initial screening conducted by general pediatrician to collect data about children's problems (n – 1784). Afterwards, the children according to their needs examined by multidisciplinary team: pediatric rehabilitation specialist, pediatric neurologist, child psychiatrist and developmental pediatrician (n – 411).

Results: As a result of the team assessment 172 children were referred to specialized medical facilities for examination, final diagnosis and treatment. 44 children underwent surgical interventions in different departments of Arabkir JMC&ICAH. 39 were referred to the Commission for medical and social Examination for determination of disability status.

The screening result revealed that 65% of examined children, mainly coming from socially vulnerable families, had not been undergone a complete medical examination before.

The screening showed urgent need of appropriate rehabilitation and developmental centers in those regions/marzes.

Conclusion: In those two regions of Armenia rehabilitation and developmental centers had been opened. These centers can serve as role models for the opening similar centers in the future. The opening of such centers is essential even for such limited resources country as is Armenia.

MOTOR DISORDERS OF CHILDREN, BONED VERY YOUNG MOTHERS

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As the World Heath Organization says, the part of boned trauma consists about 50% in the child's mortality structure, and residual phyconeurological disorders risk is very high: 60,5% – if disorder is medium severity, and 97% – in severe disorders.

Young mother's age is the first risk factor in developing pathology of gestation period, illness and mortality of newborns.

Foreign authors studied, that perinatal complications risk, when mothers age is from 13 to 15 years is 2 times higher, then risk in case of mothers age is from 16 to 17 years, and 4 times higher if mothers age is from 20 to24.

The purpose of the work is to estimate variety of moving disorders of children from newborns to 3 years, which were boned by young mothers. There were 35 children in the group of monitoring from 3 months to 3 years. Mother's age for the labors moment was from 13 to 16 years.

We saw complications of pregnancy in 91,4% of cases (anemia – 68,5%, the threat of pregnancy's interrupting – in 26 cases, gestoses in 52,4% cases. Labor finished by the natural labors ways in 80% of cases.

Labors were 68,5%, preterm – 31,5%. Mass of newborns was from 1470 to 4250 grams, Apgar's scores were 8 – 10 marks in 46%, 6 – 7 marks – 26%, 4 – 5 marks – 16%, 2 – 3 – 12%, 26% of child needed reanimation.

49% of newborns had have neurological symptoms from the first days of life (oppressions' syndrome – 40%, convulsive syndrome – 6,7%, hypertensive syndrome – 6,7%, muscle hypertensions – 5,3% of children).

Ultrasound sonography of brain founds the following damages: brain's oedema – 40%, intraventricular hemorrhage of 1,2 degree – 12%, ventricular dilatation – 12%, hydrocephaly – 2,7%, no damages – 12%.

Motor disorders were found in 42,8% of child at the moment of study: severe motor disorders in 34,6% of cases (spastic tetraparez with double-atetosis – 20,5%, spactic tetraparez – 12%, mixed low paraparez – 5,3%, 38,4% of children had motor disorders and brain's nerves pathology also (VI, VII, IX, X).

There were other neurological disorders: diffuse muscle hypotension – 24%, pyramid insufficiency-26% cases. Hydrocephaly was found in 12% of patients. 11,4% of children have epilepsy (symptomatic in all cases). There were mental disorders also: delay of development of the highest cortical function with different degrees of severity.

You see at last, that children, who were boned very young mothers have motor disorders in there neurological and more 1\3 of examined children had severe variants of disorder, which caused child's invalidation.

SPECIAL FEATURES OF GROWTH AND DEVELOPMENT IN CHILDREN WITH THE LOCOMOTOR SYSTEM PATHOLOGY

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The question of growth dynamics of patients with congenital pathology of the locomotor system has been studied relatively little. The fact, that the average body size of the newborns, such as of those with growth disorder of one of the lower limbs, do not practically differ from the size of normal children, is one of the reasons for this situation.

The dynamics of growth and development has been analyzed in 117 children with cerebral palsy, in 112 children with congenital growth retardation of one of the lower limbs, in 920 children with intrauterine fetal arrest of development and in 437 normal children of the town of Kurgan within the period from birth to 15 years.

It has been established that the longitudinal body size is practically almost identical both in normal mature infants and in those with cerebral palsy. They were 2% and 4% less, respectively, in children with growth retardation of one of the lower limbs or with that of the whole body. However, when analyzing the dependence of the rate of increasing the fetal longitudinal body size with reference to its weight it has been revealed, that the slope of the linear regression equation being normally 7.0 cm/kg ($R^2=0.987$), amounts to 3.6 cm/kg ($R^2=0.914$) for premature infants without pathological disturbances, to 3.5 cm/kg ($R^2=0.946$) – for congenital growth retardation of one of the lower limbs, to 7,4 cm/kg ($R^2=0.846$) – for mature infants with cerebral palsy.

The dynamics of increasing the longitudinal body size in normal girls and in children with growth retardation of one of the lower limbs is practically the same, in boys with limb shortening above 5 cm the steady component of the equation of the age-related body growth dynamics is 82 cm, while normally it amounts to 87 cm. In children with cerebral palsy the growth body retardation in the preschool period amounts to 5 cm, but by the age of 10 they catch up with the normal children of the same age by this parameter. Similar changes are characteristic of body weight as well. It

is only in the period of puberty when the body weight increases relatively faster in normal children.

It should be noted that arterial hypertension, being a factor contributing to the acceleration of longitudinal body growth, develops in patients with growth retardation of one of the lower limbs at the age of 8 – 13 years. As for children with cerebral palsy such growth acceleration is not observed, the mean systolic blood pressure in them has amounted to 89%±0.9 of the norm level.

Thus, the periods of the retardation and catching up acceleration of longitudinal body growth are characteristic of children with cerebral palsy both in the prenatal and postnatal developmental periods. Unlike the children with congenital growth retardation of one of the lower limbs, the period of increasing the systemic arterial pressure, being, as it has been previously mentioned by us, a factor contributing to the acceleration of longitudinal body growth, is not observed in children with cerebral palsy.

PARTICULARITIES OF PERIOPERATIVE PERIOD IN CHILDREN WITH CEREBRAL PALSY FOR SELECTIVE NEUROTOMY

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The urgency. In selective neurotomy the method and components of planned anesthesia have to assure sufficient intraoperative analgesia, neurovegetative stability, and minimal influence on excitability of motoneurons and long-term postoperative analgesia.

The materials and methods. In 15 patients with diagnosis cerebral palsy (CP), inferior spastic paraparesis with conserved intelligence was performed anesthesiological management with epidural blockade during surgery – selective neurotomy of *n. obturatorius* and *n. tibialis*. All patients were premedicated by atropine sulfate 0,01 – 0,015 mg/kg and dexametazone 0,15 mg/kg for prophylaxis postoperative nausea and vomiting. Anesthetic management was included close monitoring of vital functions (blood pressure, HR, SpO2, EtCO2) with monitor «JUTAS-300». The depth of anesthesia was assessed with BIS monitor. Patients' awakening and time to transfer them to postoperative chamber was determined according to Aldrete scale.

Results and discussion. Anatomical and physiological features of children with cerebral palsy as static encephalopathy with disorders of the respiratory, cardiovascular systems gave rise to the selection combined anesthesia with epidural blockade. Induction of anesthesia is performed with propofol in dosage 3 mg/kg with fentanyl 2 μg/kg. After introduction the dose of induction of propofol it was infused in dose 6 mg/kg/h. The choice of propofol as a hypnotic was due to the fact that the dose of 6 mg / kg / h the drug exerted minimal inhibition of the excitability of motoneurons of the spinal cord and completely didn't inhibit the H-reflex, which is very important for performing selective neyrotomy. Considering the high risk of apnea and hypoventilation, prone position during surgery we used laryngeal mask to maintain adequate patency of the lungs, than we used it to conduct assistant ventilation of lungs to insure adequate respiratory metabolism. During surgery the rate of EtCO2 was maintained in limits 35 – 37 mmHg. The choice of the laryngeal mask instead of endotracheal intubation was made because of absence of the introduction of muscle relaxants. Occurrence of neuromuscular block would lead to the inability

to clearly define the motor response to intraoperative bipolar stimulation of the motor nerve fibers. After induction the epidural space puncture was carried out at the level of L3-L4 with sudsequent cannulation with catheter Perifix (B-Braun) to the level of the L1-T12. Among local anesthetics we chose ropivakaine (naropine) in the dosage of 2 mg/kg in combination with fentanyl in the dosage of 4 μg/ml of the local anesthetic. This combination with fentanyl insured good sensor block and didn't influence on the motor block. The onset of action of the epidural block was stated in 10,0 ± 2,5 minutes. After the cessation of the infusion of propofol and reaching 8 points according to Aldrete scale (7,0±2,0 minutes after finish) we took off the laryngeal mask and after reaching 9 points in Aldrete scale (12,0±3,0 minutes after finish) the patient was transferred to to the ward. In postoperative period the duration of analgesia was between 6 to 34 hours, it let us not to use opiates and reduce the time of introduction of non-teroidal drugs. Of 15 children, only three in 7,0±2,0 hours after surgery ask for introduction non-narcotic analgesics. There were neither nausea nor vomiting, this allowed us to begin enteral feeding ealier (in 1,5 – 2,0 hours).

Conclusion. In selective neyrotomii in children with static encephalopathy the prior method of analgesia is combined anesthesia with epidural blockade (ropivakaine + fentanyl). This method ensured adequate intraoperative analgesia, eurovegetative stability and significantly improves the postoperative period, at the expense of long-term pain relief and rapid recovery of consciousness, lack of symptoms of postoperative nausea and vomiting, thereby reducing the risk of complications in the early postanesthetic period and contributes to the rehabilitation of patients.

PREOPERATIVE ASSESSMENT OF THE CHILDREN WITH CEREBRAL PALSY

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The urgency. During selective neurotomii patients with static encephalopathy represent unique challenges for anesthesiologists. Many investigations showed that children with infantile cerebral palsy had coexisting somatoneurological pathology, so it is necessary to consider it as exertion of diencephalic disabilities.

The materials and methods. In 15 patients with diagnosis CP, inferior spastic paraparesis with conserved intelligence was performed anesthesiological management with epidural blockade during surgery – selective neurotomy of n. obturatorius and n. tibialis. These operations were planned and done in neurosurgery department of regional pediatric clinical hospital, Dniepropetrovsk city. The patients were from 4 to 15 years old. All patients were examined preoperatively, survey included: common laboratory investigations (blood, urine, biochemical analysis of blood), the functional testing of cortical and subcortical structures of brain with electroencephalography (EEG), and also evaluation of cardiac and respiratory systems (ECG, echocardiography, blood pressure, heart rate, spirography).

Results and discussion. When assessing initial patients'status it should be noted that according to EEG in all children of experimental group against neuronal exaustion, the signs of diencephalic changes with irritation of the limbic-reticular complex with lowering the threshold for seizure activity were observed. Evaluating parameteres of rheotachygraphy according to data of H-reflexometry found signs of failure of pyramidal, hypertonus of central type, increase in the central and spinal influences on muscles in 80% of the patients.

The findings of our study suggest an adverse functional status of the respiratory system in children with CP, as evidenced by decrease in vital capacity in 17–28% as compared with age rate, decrease in vital index. 50% of the observed are restrictive, and in 16.6% obstructive disorders. At the same time rates of acid-base status was consistent with the norm. Limited motor activity in children with cerebral palsy also has a negative effect on the cardiovascular system.

Study of chronotropic cardiac function in a state of relative dormancy showed that children with cerebral palsy had a higher data of heart rate (in 18–21% of normal). In 60% of cases 15% of normal performance showed increase in mean blood pressure (MBP). In children with cerebral palsy at echocardiogram were recorded and structural and functional changes of the heart: in 92% of cases – regurgitation at the mitral valve to the annulus, at the tricuspid valve – to the 1/3 of the right atrium, in 10% of cases – enlargement of the right ventricular cavity, in 32% of cases in heart ventricles false chorde was rendered. With ejection fraction in all cases corresponded to the normal rate.

Conclusion. Such anatomical and physiological features of children with cerebral palsy as static encephalopathy with disorders of the respiratory, cardiovascular systems gave rise to the selection combined anesthesia with epidural blockade.

POSSIBILITIES OF INFANTILE CEREBRAL PARALYSIS TREATMENT

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According to the data of World Health Organisation (WHO) the number of handicapped kids consists 2 – 3% among all kids population and keeps on growing. Infantile cerebral paralysis (ICP) is taking the leading place in the structure of infantile's disability.

Goal: dynamics of neurological status among the patients with ICP under the influence of fetal stem cells (FSC) treatment.

Material and methods: The paper contains the results analysis of 23 children with ICP, 11 boys and 12 girls, with the age range between 1,5 to 8 years old (4,85±1,04 years). 14 kids had spastic diplegic form, 6 had hemiplegic form and 3 had an ataxic form.

12 children, who were the part of the first group, were treated with standard therapy with the use of medical physiotherapy, massage, acupuncture, reflexotherapy, osteopathy, education program with speech therapist, animal-therapy. Kids of the second group (11 children) additionally had transplantation of hematopoietic and non-hematopoietic FSC harvested from germ layers of internal organs of 4 – 8 weeks old legally aborted fetuses. Controlling neurological check-ups were conducted before transplantation of FSC and six months later after the treatment.

Results. 6 months later after treatment 41,66% of children from the first group demonstrated decreasing of muscles spastics and increasing of speech vocabulary. 63,64% of children of the second group showed the decrease of muscles spastics and increase of speech vocabulary in 6 months after treatment of FSC. The improvement of cognitive functions were observed at 58,33% of children from the first group, and 81,82% of kids from the second one. Also reduction of spine deformation was noticed at 25% of children from the first group and at 45,46% of kids from the second one.

Conclusions: High efficiency of fetal stem cells application was proven during ICP treatment and its positive influence on improvement of cognitive functions, reduction of muscles spastics and spine deformation.

EXPERIENCE IN THE USE OF HYPOXIC–HYPERCAPNIC POSTCONDITIONING IN TREATMENT OF ISCHEMIC STROKE

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Introduction: the problem of rehabilitation of patients after ischemic stroke (IS) is one of the priorities of modern medicine, because of the statistics after a stroke, only 20% of patients return to active work, 60% – are disabled and 20% in constant need of third partycare.

Objective: to study the influence of training with hypercapnic hypoxia on the restoration of disturbed brain function resulting from ischemic stroke.

Materials and Methods: The study involved nine patients who underwent AI. Inclusion criteria were: age from 40 to 65 years, early or late recovery period transferred the AI (the time after a stroke from 1 to 24 months). All participants on the background of the classical treatment of stroke (Antiplatelet, neuroprotectors), as well as concomitant therapy and the background pathology, were training on the breathing simulator "Carbonic» that creates hypercapnic hypoxia in the inspired air (5 – 8% CO_2, O_2 17.11%), for 3 weeks to 20 minutes daily. Muscle strength was assessed by the carpal dynamometer, muscle tone was assessed by Ashworth scale, psycho-emotional background investigated using Hospital Anxiety and Depression Scale, was also carried out test Stange.

Results. The study showed that an increase in muscle strength on the side of paresis (paralysis) from carpal dynamometry averaged 5.8 kg. There was a significant decrease in spasticity: 2.7 points before training, after a 1.8 magnitude in the paretic hand, paretic leg in training to 2.75 points after 2 points on a scale of Ashworth. Stange sample before training 36.7 seconds. after 45.7 seconds. Found to decrease the severity of anxiety and depression, improved mental and emotional background, improving sleep, reducing the intensity and frequency of headache, dizziness. During the training side effects were reported.

Thus, the first phase of exploratory research on the effectiveness of training with hypercapnic hypoxia showed a reduction in neurological deficit, the functional reserve of patients in the early and late recovery phase of ischemic stroke.

GROUP WORK AS A SOCIAL PSYCHOLOGICAL ASPECT OF TEACHING CHILDREN WITH AN ORGANIC BRAIN LESION

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The majority of children with an organic brain lesion have problems with the formation of speech – the most important and complex mental function. Communication need is not innate but is formed in vivo. The damaged central nervous system adversely affects the formation of speech but a certain correction takes place in the course of infant development, the success of which depends on the internal reserves of an organism as well as social conditions (Smirnova I.A.). Children with brain lesions often have limited social intercourse which leads to the unsociability, negative emotional reactions and the "fear of speech" phenomenon. They are not able to use even those speech capabilities that they have to communicate with others; the results obtained at our individual classes are not often transferred into the sphere of communication outside the class. Therefore, in order to recover verbal and other forms of communication of our patients, we use an "individual lesson – group work" system (Tsvetkova L.S.).

Group work as a form of a social psychological aspect in teaching is the very method with the help of which, first of all, we detect the speech disturbance associated with the personal characteristics of a child and his or her attitude; secondly, we overcome the negative effect of the personality and attitude changes on the communication; and, in the third place, we effectively influence the speech development and restoration using its social conditioning that can be implemented only in groups. (Tsvetkova L.S.). The group work is carried out in a group of 5 – 7 children. We take into consideration the children's age, peculiarities of speech and behavioural disorder as well as physical condition. The objectives of the group work are to overcome communication difficulties and the related personality changes of a child; to disinhibit verbal and nonverbal forms of communication; to create the required motivation for the speech activity. These aims are obtained through the implementation of different types of the activity – communication, training, labour. We apply the forms and functions that are the most effective in the group work (emotive, dialogic and group). A small group ensures the required environment for children with serious speech disturbance. This environment is close to the natural as much as possible and promotes the most intact, emotional and expressive forms of speech.

During our classes we consider the simplicity of grammar and high frequency of the vocabulary used. The advantages of the small group therapy over an individual lesson are the presence of specific group mechanisms: imitation, support, mutual assistance, cooperation and positive emotions between the group members.

As a result, we consider this form of work as the shortest path to verbal communication as well as socialization of children with organic brain lesions.

MANAGEMENT OF DYSTONIC HIP SUBLUXATIONS WITH PERCUTANEOUS SCREW HEMI EPIPHYSIODESIS

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Objective: to present the early results of a new technique of management of hip subluxation in dystonic cerebral palsy.

Methods: from the data base of 300 children with dopamine responsive dystonia, all who were on oral L-dopa, children with hip subluxation were sought. 32 children with 46 hips were present, only 4 did not respond to l dopa and percutaneous adductor tenotomy, the present study analyses these 4 children managed with percuataneous screw hemi epiphysiodesis after 6 months of FU, all children were of GMFCS grade 5 all procedures completed under short general anaesthesia, operating time average 27 min under image intensification, day care procedure with less than 5 ml blood loss, single screw placed crossing the medial part of the capital femoral epiphysis on the involved side.

Results: after a period of 6 months of follow up 3 hips showed reduction in the degree of subluxation to less than 30% and 1 showed stabilization, none of the children had any complications or progress in subluxation.

Conclusions: management of hip dislocations in cerebral palsy is a difficult problem with usually relentless progress specially in GMFCS grade 5 with high reoperation rate and complication rates, the only recourse left to the surgeon is often doing open reduction with pelvic and femoral surgeries in a child with dystonia the surgeon is often perplexed as surgery is contraindicated due to fear of failure, percutanous screw epiphysiodesis offers a minimally invasive method of treatment, short term follow up shows it to be effective. long term folllow up in a bigger cohort is required

Keywords: dystonia, movement disorders, cerebral palsy, GMFCS, hemi screw epiphysidesis, hip subluxation

EREBELYI–OGSTON PROCEDURE FOR MANAGEMENT OF EQUINUS DEFORMITY IN CEREBRAL PALSY

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Objective: equinus foot is common in hemi plegic cerebral palsy and in some cases of diplegic/dystonic cerebral palsy, the procedure of tendo achilles lenthening though seemingly easy is fraught with the complication of increasing crouch in the long term follow up, the paper looks at an alternative procedure to circumvent this problem.

Methods: from the data base the cohort of children who had undergone this procedure of percutaneous talar decancellation with or without cuboid decancellation(in case of varus deformity) were selected, all efforts were made to compare this cohort to children who had undergone selective gastronemius lenthening in dipegics and combined gastro-soleus lenthening in hemiplegics in terms of age, weight, ambulatory status and cognitive status., all children with concommitant other surgeries were removed from the cohorts.there were 17 children in the Verebelyi-Ogston procedure group and 48 in the tendo achilles group, follow up was at least 1 year with average of 1.8 year, mean age of surgery was 8.9 years the cohorts were compared in terms of time to comeback to preoperative levels of function, angle of crouch, functionality at 1 year follow up and crouch angles.

Results: children with Verebelyi-Ogston procedure took longer time to reach preoperative levels of activity(4.2 months vs 2.8 months) but at 1 year fu were equally active to the children with tendo achilles lenthening, crouch angles at comparable.

Conclusions: natural history of cerebral palsy is that of equinus turning into crouch, this paper shows that the bone-muscle length discrepancy at the ankle can be addressed without muscle lenthening, long term FU in larger cohort is warranted.

Keywords: cerebral palsy, hemi plegia, diplegia, equinus, tendo achilees surgery, Verebelyi-Ogston procedure, crouch.

SURGICAL TREATMENT OF KNEE AND ANKLE DEFORMITIES IN DYSTONIC CEREBRAL PALSY–ANALYSIS OF EFFECTIVENESS OF STRATEGIES

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Objective: surgical management in dystonic cerebral palsy is fraught with failures, most traditional text books in orthopaedic world therefore caution against the use of surgery in such children, with the increasing acceptance of L-DOPA supplementation as a valid treatment option in segawa`s disease and the increasingly greater understanding of the process specially in the indian subcontinental context meant a relook at surgical strategies for such children, this paper is an attempt to look at the cohort of children who need surgery at the knee and ankle who are already using L-DOPA for at least 6 months and still have deformities which are causing functional limitations.

Methods: from the data base of the indian cerebral palsy clinic children who are dystonic were collected, out of these 325 children all of whom were on L dopa/carbi dopa combination for at least 6 months in follow up were collected children who needed procedures at thir knees and ankles leaving 68 children, 63 children were managed with botulin and plaster. 5 children needed surgery – 1 hip was treated, 8 knees and 1 ankle treated surgically, as a protocol in none of the cases was the muscle tempered with, all deformities were treated by bony angular changes and in case of ankle by talar decancellation.

Results: all children had uneventful rehabilitation, in no case did the dytonia spread to other muscle groups and deformities were corrected sucessfully.

Conclusions: this small cohort shows that

1) surgery is possible in children with dystonia specially under cover of L-DOPA

2) bony corrections give reproducible results compared to muscles

Keywords: cerebral palsy, dystonia, surgery, correction.

STRUCTURE OF EPILEPTIC SYNDROME IN URGENT NEUROLOGIC PATHOLOGY

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The purpose of this research was to study epidemiological and clinical features of convulsive syndrome the providing urgent neurological treatment. The investigation cohort included 203 history cases of convulsive syndrome treated in the neurological department of the Petrozavodsk Emergency Hospital during 2010–2011 period (of those investigated 128 (63%) were male, 75 (37%) – female patients).

The results of the work revealed two peaks of morbidity in women – 26–35 and 46–55 years, whereas in men the only morbidity maximum was in 15–25 age groups. First time convulsive syndrome was diagnosed in a quarter of the cases. Symptomatic convulsions predominated (68%), while essential and cryptogenic forms were diagnosed only in 32% of cases. The leading forms of causal pathologies with symptomatic convulsion paroxysms were the following:

- Cerebrovascular diseases and stroke consequences (31%)
- Severe head injuries (32%)
- Less common reasons were perinatal pathology of CNS (central nervous system) (7%) and CNS tumors (2%).

The risk factors of convulsive seizure were most often abstinence of alcohol and stopping of anticonvulsants. There were more common types of convulsions:

- Generalized tonic-clonic spasms (88%),
- Partial seizures evolving to secondarily generalized seizures (13%).

Comatose state (26%) was induced by protracted generalized tonic-clonic spasms (series 5% status 1%) against the background of alcohol abstinence. Focal neurological symptoms (coordination impairment – 30%, speech disturbances – 9%, motor deficiency – 7%) was caused consequence of cerebrovascular accident, severe head injury or metabolic encephalopathy.

According to EEG data paroxysmal activity was absent in 35% of those cases. Pathologic alterations, seen on CT, took place in 61% of cases (32% – liquor cysts, mixed hydrocephalus – 42%).

32% of those patients were treated with basic anticonvulsants on the pre-hospital stage mostly for symptomatic forms of epilepsy (62%), they received Carbamazepin (56%), combination of Carbamazepin and Phenobarbital (52%), Carbamazepin and Valproic acid (20%).

In 29% of the cases the drug has been changed and only in 9% the addition of another drugs was needed. As a result the rate of convulsive activity declined in 16% of patients, while in 84% of those treated convulsions were absent.

Against the background of the anticonvulsive treatment clinical remission was reached in 93% of cases. Hence, in structure of epilepsy female morbidity with secondary convulsive syndrome predominates. The leading causes of secondary epilepsy are cerebrovascular diseases and severe head injury with generalized tonic–clonic seizures.

DELTA–SLEEP–INDUCING PEPTIDE IN TREATMENT OF CEREBRAL PALSY

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Delta-sleep-inducing peptide (DSIP) are known as an important regulative agent, antioxidant and cell-protector with main role as antistress agent and homeostasis-maintaining substance (Sudakov et al., 2008). Its drug form was used in treatment of diabetes mellitus in elderly (Odin et al., 2005), epilepsy and amyotrophic lateral sclerosis (Voitenkov, Mikhaleva, 2011). In our work we have shown that it also may be used in treatment of cerebral palsy in children.

We performed open trial of efficacy and safety of delta-sleep inducing peptide (DSIP) preparation in treatment of cerebral palsy in children. Treatment group included 36 children, aged 4 – 15 years, with different forms of cerebral palsy. Main symptoms included pareses, hemiplegias and spasticity. Delta-sleep inducing peptide preparation was used intranasally, according to standard operating procedure in the case with regulatory peptides. Doses used were 3 mg o.d. in 5 consecutive days. Trial was allowed by institutional ethics committee.

We estimated volume of active movements, strength, changes in muscle tonus, intellectual dynamics, EEG changes and psychological changes along the course of treatment. 2 months after the discharge follow-up visit was made.

There were no any adverse events during the treatment and follow-up period. After the treatment general improvement of memory, motivation and cognitive functions were observed. Walking abilities, fine movements were also better after the treatment. Spasticity symptoms did not show any changes, though.

Psychologically in all patients positive changes were observed. Patients become more stable, attention concentrating, field of attention, analytic capacities, self-esteem improved. Anxiety symptoms become lesser.

EEG in 75% of the patients showed general improvement of alpha-rhythm, with increase of frequency and amplitude. In 5 cases epileptic patterns disappeared.

COMPLEX APPROACH TO NEUROREHABILITATION FOR CHILDREN WITH CEREBRAL PALSY (CP) IN CONDITIONS OF CHILDREN'S IN–PATIENT DEPARTMENT OF CPS–AND–N

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At the Center of Speech Pathology and Neurorehabilitation in 2010 years have been opened an in-patient department for children with consequences of local brain lesions, which is structural subdivision out – and inpatient children's department. Neurorehabilitation for children is carried out at the in-patient department with different cognitive, psychosomatic, movement disorders and cognitive arising from stroke, brain injury and neuroinfection

In our department children with CP rehabilitate. In the forefront these patients is evident both movements and speech disorder (mainly dysarthria and language retardation of different intensity). After examination child's problems are identified, and program of complex neurorehabilitation is made.

In the process of all neurorehabilitation course child receives complex rehabilitation which includes:

- daily examination of neurologist, psychiatrist, drug therapy, as well as psychologistic examination and sessions with psychologist, neuropsychologist (individual and group sessions);
- examinations and correction with speech therapist (individual, group sessions with speech therapist no less than 2 – 3 individual and 1 – 2 group session per day); music therapy (movement and speech eurhythmics is everyday) sessions on animation (1 – 2 sessions with per week);
- massage (on exercise therapist's orders after his consultation); physiotherapy (after consulting physiotherapist);
- the diagnostic examinations (laboratory, functional method) are carried all children, who are on the course of treatment, and they is administered by doctors. Length of neurorehabilitation course at our inpatient department is 45 days.

Main focus is training breathing: overcoming synchronism between breathing, phonation and articulation; developing motor articulatory activity (increasing amplitude of movement language, lips; training accuracy and smoothness of articulatory movement, and they are keeping

by count). Massage of facial muscle, tongue is carried out; when the disorder of voice are used methods of active gymnastics (the blowing into mouth-organ, rinsing throat with fluid of different consistency, e. g. by kissel, kefir); voice exercises, which include training strength, key, flightness of voice. Singing is actively used (the singing syllable, word, fun small story on one tone).

Focus is also training rhythmic and prosodic characteristics of speech (speech eurhythmic exercises are used as well as sessions with apparatus < monologue >). As a result of complex work of all specialist's department are succeed to achieve good positive dynamics, both motor and speech area.

USE OF ALGORITHMS IN THE MANAGEMENT OF DIFFERENTIAL–DIAGNOSTIC SYNDROMES

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Introduction: In accordance with evidence-based medicine demands, the importance of this paper lies in providing maximally efficient evidence-based medical treatment. Thanks to using of modern informative technologies this task can be really solved. Lately there has appeared a unique chance for a physician to get an access to the patients' data-bank, history and recurrence of the disease, thus excluding any subjectivism in making a diagnosis.

Objective: to develop an algorithm which would help to outline a differential-diagnostic syndromes (DDS) based on intellectual data – mining and to demonstrate this method on patients with different nosological forms of tumors of basal-diencephalic localization.

Material and methods: The data-base included results of complex clinical and paraclinical examinations of 368 patients with basal-diencephalic tumors operated in the Burdenko Neurosurgery Institute.

Methods: The study design by type was "case-control". It was a 3-stage process: 1st stage – search for a variety of possible topic cases, 2nd stage – selection of a group of patients with an interested type of tumors (the basic group) and "small" groups of patients with other types of tumors of basal-diencephalic localization (comparison group), 3d stage – generation of predictable DDS and its evaluation by such indications like sensibility, specificity, risk correlation by a 4-grade table of clinical epidemiology "test-disease". To solve this task it was necessary to modify a standard algorithm of associative search from the data-mining arsenal. We used selective values of all the above-mentioned indications and their 95% – evidence-reliable (доверительный) intervals for the outlined DDS.

Results and discussion: The developed algorithm allowed outlining of DDS for patients with different anatomic, topographic and histological types of basal-diencephalic tumors. Low evidence-reliable threshold for all syndromes was > 1, thus proving their guaranteed positive informativity. The developed algorithm can be recommended for outlining a DDS in order to specify and enrich neurological semiotics in practical management protocols for patients with brain tumors, and thus providing improvement of diagnostic technologies and reliability of the decision making for improving treatment tactics and its effectiveness.

THE ROLE OF OZONE–THERAPY IN THE COMPLEX TREATMENT IN PATIENTS WITH POLYTRAUMA

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The number of patients with polytrauma has been increased, especially in city with high level of speed technologies (the development of the new models of cars, transit rapid system, etc.). Often the patients have scalpel, lacerated, deep crushed wounds, especially in cases of car injury or railway trauma. Our aim was to analyse our experience of the complex treatment in patients with polytrauma with using ozon-therapy.

Patients and methods: our experience of using of ozone-therapy in complex treatment in patients with polytrauma, who were treated at Municipal Clinical Hospital 14 named after V.G. Korolenko, Moscow, which is clinical base of medicine of catastrophes department of Moscow State University of Medicine and Dentistry (MSUMD), after different mechanism of trauma is presented.

There were 98 men (57,3%) and 83 women (42,7%). It is interesting to stress, that the mean age of the patients was 43 years (18 to 89). All patients were admitted to the hospital as an emergency. Polytrauma was predominant (included 83 cases (48,5%) with different wounds (scalpel, lacerated, deep crushed), 58 cases (33,9%) with intra – and extra-articular tibia fractures, fibula fractures, calcanel fractures, talar fractures; 9 (5,2%) with hip fractures; 40 (23,4%) with pelvic fractures; 50 (35,0%) with chest and ribs fractures; 19 (11,1%) with fractures of different bones of wrist and forearm; 9 (5,2%) with humeral fractures). Shock was diagnosed in 171 patients (100%). There were 70 (40,9%) patients with open fractures.

All patients were carefully examined, different laboratory and instrumental investigations (routine laboratory studies, urinanalysis, serum, biochemical, bacteriologic tests, X-ray studies, laparoscopic investigations, etc.) were administered. We have used early diagnosis, intervention and modern surgery methods (reposition of bone fragments, traction, extension, pulling pluster, bandage immobilization, different methods of osteosynthesis with new models of constructions). In some cases different methods of treatment were used (for example, plaster cast to immobilization wrist fracture and closed osteosynthesis of femur fracture). We have never used adhesive, board or underwater tractions. In all cases of any, including post-

operative, wounds we used ozone-therapy. We have apparatus for external and internal ozone-therapy ORION – OPM-1 with different complectation elements (cameras for leg-foot, arm-wrist localization). Ozon is a gas with severe bactericide and antivirus affects. At the same time this apparatus can be used for express sterilization, has simple regulation of concentration of gas in cameras and exposition time. The main advantage is it's compact size and little weight (6 kg), that is why every surgeon can begin external ozon-therapy in any ward in any department (traumatology, neurosurgery, surgery, etc., even in resuscitation department) in the first hours after injury. We have used the method of early rehabilitation using therapeutic gymnastics, massage programme to train the extremities and joints.

Results and discussion: we have no complications after using ozone-therapy. We have obtained very good results of using ozone-therapy in complex treatment of our patients, only 31 with severe polytrauma have died, the others have favourable short- and long-term results. In conclusion we'd like to say, that complex treatment with using modern methods, such as ozone-therapy, early surgical procedures and rehabilitation can play a valuable role in maintaining patient's overall health and quality of life.

DISORDERS OF POSTURAL BALANCE AND GAIT IN PATIENTS WITH VASCULAR PARKINSONISM AFTER TRANSIENT ISCHEMIC ATTACKS OR LIGHT STROKE

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Disorders of postural balance (DPN) and changes in gait have been accompanied by vascular parkinsonism (VP). They can lead to difficulties in movement and patients falls, and so high medical and social importance of this issue is determined. The purpose of thisscientific work is to study the DPN and the changes in gait in those patients with VP who have had transient ischemic attack (TIA) or light stroke.

Materials and methods. 48 patients (mean age is 64,35 ± 10,96 years, 30 men (62,5%) and 18 women (37,5%)) who have had TIA or light stroke have been examined. Exclusion criteria have been: trembling manifestations of Parkinson's disease, as well as paresis and cerebellar ataxia. The patients have been divided in two groups: 1st with VP (18 patients at an average age of 67,27 ± 6,90 years, 13 men and 5 women), 2nd – no akinetic-rigid symptoms (30 patients; 61,47 ± 12,18 years, 17 men and 13 women). Patients have received clinical, functional (tests Bohannon and Tinetti), and neuroimaging examinations (computed and magnetic resonance imaging of the brain).

Results. Patients in the 1st group akinetic-rigid symptoms have had mild degree. Expression of DPN has not significantly differed between the comparison groups ($p > 0,05$). Test Tinetti's total score was 13,78 ± 4,44 in the 1st group, 13,77 ± 4,21 – in the 2nd (a moderate degree of dynamic DPN); test Bohannon's one – 4,00 ± 0,88 and 4,13 ± 1,12 respectively (age norm of static postural balance). In the 1st group the disorders of static postural balance component have occurred in 5 cases (27,8%), but dynamic one – in 17 (94,4%); $p < 0,05$. In this case mild disturbances of static postural balance have been available in 4 cases (22,2%), moderate – in one case (5,6%). Light dynamic DPN have been in1 case (5,56%), moderate – in 12 cases (66,7%), expressed – in 4 cases (22,2%). Patients in the 2nd group have hada static component of DPN in 10 cases (33,3%), but a dynamic component – in 30 cases (100,0%); $p < 0,05$. Mild disorders of static postural balance have beenin 9 cases (30,0%), moderate – in 1 case (3,3%). Light dynamic DPN have been observed in 4 cases (13,3%),

moderate – in 18 cases (60,0%), expressed – in 8 cases (26,7%). Disorders of the dynamic component of the postural balance have dominated in both groups and been often moderate and expressed. As to the 1st group as for the 2nd have been the changes of gait. In patients with VP the "shuffling gait" has been noted in widely-spaced legs with a decrease in the length and height of the step. For the 2nd group of the most typical gait has been a cautious, slow, and atactic which has manifested by loss of balance while significant decreasing area of support. The deviation to the sides has been characteristic of them then moving. Movement of the arms and legs at the same time have not been coordinated, torso twists – with difficulties.

Conclusions. Akinetic-rigid symptoms in the early stages do not lead to significant disorders of postural balance. When combined a cerebrovascular disease with mild early manifestations of vascular parkinsonism, plastic hypertonus enhances the balance of patients and the compensation for postural dysfunctions. Transient ischemic attacks and light strokes in the first month of the disease are accompanied by moderate dynamic balance disorders.

POTENTIATION OF THERAPEUTICAL EFFECTIVENESS OF COMBINED USE OF BLOCKADES BY DISPORT AND REFLEXORY–STRESSING SUIT "GRAVISTAT" FOR CHILDREN WITH SPASTIC FORMS OF CEREBRAL PALSY

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There were 35 children at the age of 3–8 years with spastic forms of cerebral palsy with positive diagnosis of cerebral palsy under our monitoring. Other diseases of nervous system were excluded by methods of MRI of brain and spinal cord, biochemical, genetic laboratorial testings. There were 22 boys and 13 girls, as for form of cerebral palsy there were 17 children with double hemiplegic form and 18 children with lower spastic diplegia. Spasticity was estimated with help of Answorth scale, state severity according to GMFS scale was 3–4 level. While choosing children for carrying blockades by disport we especially paid attention for clinically sound myogenic spastic syndromes: hamstrung, rectus, adductor, triceps. All children got treatment with ENMG, identification of muscles-"targets" with the help of device "Synapsis MIST". For each blockade we used from 250 to 500 units of disport according to age, weight and spasticity intensity (10–30 points per kg).

After relaxation from the third day patients got proprioceptive correction with the help of special reflexory-stressing suit "Gravistat". As a result of realization of this methodic we emphasized an improvement of rehabilitation effectiveness. Hereafter 10 children got occasional blockades by disport because of effect decrease, 3 children got this therapy for the third time. Dynamic supervision of given group of children for 2 years showed essential effectiveness of this methodic: 5 children didn't need dynamic proprioceptive correction any more, but got therapeutic exercise and necessary therapy.

CLINICAL AND EPIDEMIOLOGICAL DATA ON SPINAL PALSY AMONG CHILDREN PETROZAVODSK (according to city children's Hospital in Petrozavodsk for 2010–11)

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Cerebral palsy is one of the actual problems of modern Neurology, as in recent years, there has been an increase in the number of children with cerebral palsy.

The purpose of the study: to determine the incidence of cerebral palsy and disease at risk for cerebral palsy among children in Petrozavodsk for 2010–2011.

Identify risk factors, clinical forms, particulars currents, the distribution of cases by gender and age.

Materials and methods: the analysis of the medical records of children received treatment in neurologic Department and early childhood Office city children's Hospital Petrozavodsk in 2010–2011. Dynamic inspection was conducted of somatic and neurological status of identified children with cerebral palsy.

The results of the study: the analysis of the medical records of patients from 1531 in neurologic and younger city children's Hospital in Petrozavodsk in 2010–2011.

In addition to handling medical records, were surveyed 4 children with cerebral palsy, who studied neurological status, dynamic monitoring of this group of patients.

Results: Of children treated in neurologic 1006 at the SSD Petrozavodsk in 2010–2011 received treatment for 10 children (1.006%) with cerebral palsy.

At the early age of SSD 525 patients (0.7%) found 4 patients with cerebral palsy.

The most common risk factors for this group of patients were infected during pregnancy and delivery (herpetic and urogenital), as well as heavy labour and delivery by elective caesarean section. The most common clinical form of cerebral palsy spastic hemiparesis light was found in 70% of patients. Gender composition is the predominance of boys over girls (56% and 44%, respectively). In the age of plan notes the prevalence of infants with cerebral palsy (38%).

All patients had been general helth-improving therapy, which consisted of vitamins of Group B, nootropics, metabolic, modular, antispastic. Children receive active treatment (various kinds of massage, LFK, BOS, accupunture, paraffin wraps, magnetic and light amplification by stimulated emission of radiation). Most children death from hospital with improvement.

Conclusions: cerebral palsy is a heavy disease of the nervous system in children, which in 2010–2011 amounted to more than one percent in neurologic Department SSD and 0.7% at young ages. The most common risk factors for the development of cerebral palsy were infection, difficult childbirth, delivery by elective caesarean section.

The most common form of cerebral palsy has been spastic gemiparetic form, more commonly occur in boys.

THE ROLE OF LONG–TERM INJECTION PROGRAMS BOTULINUM TOXIN TYPE A IN A COMPLEX REHABILITATION OF CHILDREN WITH SPASTIC CEREBRAL PALSY

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Topicality. The search of effective methods of conservative therapy at children with spastic forms of infantile cerebral palsy (DCP) will allow risk descending of early surgical interference, which inevitably leads to exacerbations and occasional episodes of operative treatment.

The object of the research is the estimation of long-term injection programs botulinus toxin A type at motional opportunities and form tempo postprimary orthopedic complications at children with cerebral palsy.

Materials and methods. Have analyzed the examination results of 67 patients (5,1±1,8 years old) – the first group, who had three injections BTA, and 29 children (5,0±1,6 years old) – the second group, who had five injections BTA. The rated dose of BTA (Диспорт®) is 27±4 cell/kilo. The group of comparison included 41 children, who had the same treatment without injections BTA.

The results. During the watching of 67 first group children, who had five injections BTA, in 6 weeks after every injection there were statistically registered the accurate decrease of muscle tonus on-scale Ashvort and the value increase of motion in abarthrosis. By the 24th week the measure of spasticity and motion value in abarthrosis had a negative trend, but didn't reach the intact pre- injection measures, gradually improving from injection to injection. Watching the dynamic of children's motional development with (DCP), as the result of repeated injections BTA it is shown, that the majority of children had a motional improvement after the first injection. With every next ring of botulinus therapy the number of children, who overpassed to a new motional level, was less. As a result of the 4th and the 5th injections BTA there wasn't the increase of number of children with (DCP), who overpassed to a new motional level. In 18 months of watching after three injections BTA, it was noted the decreasing tendency of the frequency of forming attached contractures and the deflection of abarthrosis in comparison with children, who didn't use BTA (60% to 68%, p=0,534). In 30 months of watching after five injections BTA it

was exposed the statistic significant decrease of the need in orthopedic surgeon (ортопедохирургической) alignments in comparison with children without injections BTA (76% to 95%, p=0,015).

The conclusion. The long-term use of BTA reduces the tempo of forming postprimary orthopedic complications, assisting the precaution of early orthopedic surgical interference.

MRI – MORPHOMETRY OF CORPUS CALLOSUM IN CHILDREN WITH CEREBRAL PALSY

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Cerebral palsy (CP) is the most frequent cause of motor handicap among children. The frequent CP risk factors are prenatal complications (cyanosis, preterm, low birth weight and other). CP and poor neurodevelopmental outcome may be induced by disontogenetic process within cortex during second and third trimesters of gestation. Previous histologic studies of the cortex prenatal development suggest that corticocortical populations of pyramidal cells are subject to significant vulnerability and are most likely to be affected in case of prenatal complications (Zykin et al., 2009; Krasnoshchekova et al., 2010). Corpus callosum might be considered as a structure integrating cortical connections and therefore it's hypoplasia may indicate the initial disontogenetic process in some of the cortex layers.

The aim of the study is to reveal the relation between CP and interhemispheric cortical connections pattern. Forty-five patients with CP were age and gender matched with the control patients. Sagittal plane MR-images acquired at State Pediatric Medical Academy department of radiology. Mid-saggital images were co-registered, corpus callosum profile was obtained either manually or with computer-aided morphometry approach. The profile was segmented to 7 parts according to Witelson (1989) method. Taking exact topography of corpus callosum into consideration we have derived collosal coefficient (CCc) which describe ratio between genu, trunk (the part which mediates prefrontal connections), isthmus (which mediates pre- and postcentral area connections), splenium (temporal and occipital areas).

Healthy children had a higher coefficient (CCc) values then patients with cerebral palsy. The conclusion is that a deficit of certain cortex area connections could, among other reasons, be involved into pathogenesis of neurodevelopmental diseases.

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