

The Osteopathic Treatment of Neurological Disorders in Children.

By: **Alexei Dzyuba**

19 years ago Russian Osteopaths began to treat children with nervous system pathologies, combining classical clinical and neurophysiological methods of diagnosis with osteopathic treatment – taking into account anatomical and functional, biomechanical features of child's organism. Approximately 3000 patients, with various neurological pathologies, aged 0-17 years have been treated. Inspections were carried out according to commonly accepted standards, there were used such methods as neurosonography, trans-cranial doplergraphy, electroencephalography, rheoencephalography, x-ray, and when necessary – magnetic resonance imaging. Due to this unique comparative material it was possible to appreciate the advantage of complex, integrated approach to diagnosis and treatment of neurological disorders among children.

Since the moment of fertilization of mother's ovum cell the fetal development progress is influenced by the interaction between two major factors: the genetic heritage and conditions of external and internal environment. Abnormalities of perception, intellect, speech and communication may result from genetic imperfections or various environmental factors – both external and internal – that cause damage or delay in development of various parts of brain (intrauterine infection, blood flow disruption, hypoxia, injuries, etc.) These abnormalities can be caused by the injury of so-called "matrix" or "developmental" areas of the brain, that are responsible for formation of various sectors of the brain, establishing connections between them and formation of neuron networks, that are responsible for various functional systems. Dyssynchronization of development of functional systems or their parts in time may lead to severe static-motor or speech function abnormalities.

The sequence of the most important stages of early ontogenesis (both intrauterine and post – natal), the basic of which are: formation in the periventricular area over 100 billions of neurons, and their migration towards their destination point, growth of an axon towards the receptive cell, growth and branching of a dendrite tree, final stages of synapse genesis with the subsequent selection of the most functional connections, intensive multiplication and differentiation of the neuroglia cells, processes of ganglination. The cell substratum of the brain adaptation in the post-natal period is the start of dendrite tree branching.

Due to the interaction with the environment, new neuron connections are formed, that serve as the basis of post-natal functional systems. The intensity of the dendrite tree branching depends directly on the activity of a certain area of the brain – and vice versa, so it determines and assures functional activity of a brain areas. The most active period of axon and dendrite branching is first 2-3 months of post –natal life (2-12 weeks) – first it is overabundant, and then only the most effective connections are chosen. Various negative factors on internal and external environment cause negative effect, that manifests as "blockage" of dendrite tree branching and "freezing" of neuron development at the initial stage and formation of abnormal neurons with callous dendrite tree. Factors that contribute to such pathology may be: intrauterine fetus hypoxia, birth trauma of the brain, influence of toxic agents, abnormal metabolism changes and early post-natal infectious and vascular injuries of the brain.

During the last 20 years due to the development of the ultra-sound scanning of newborns and infants, as well as x-ray and tomography, there has been found sufficient evidence of connection between changes in peri-ventricular area of the brain during intrauterine gestation period and subsequent development of static-motor and verbal functions. Early pathologies in the peri-ventricular area, that occur during intrauterine, pre-natal and post-natal stages, when the brain is still in the process of active formation, leads to abnormalities in structural and functional maturation of the brain. This is distinctive syndrome – abnormalities of development of formation of psychoneurological functions in five major areas of development: motional, perceptive, intellectual, verbal and communicative. After the brain formation is complete, it manifests as disorders of trophic and immune functions of the brain. It has to be noticed, that during such critical periods peri-ventricular area (PVA), maintains its immature condition for prolonged time, and thus, keeps its matrix, formation capabilities active longer than usual. It also has to be stated, that blood supply of PVA is divided between various vascular basins. The area of frontal-lower horns of lateral ventricles is a part of a carotid basin, while PVA of occipital horns of lateral ventricles, brainstem, the belly and the hemispheres of the cerebellum – is a part of vertebral basilar basin. The PVA of the spinal marrow is supplied mostly by the basins of the frontal spinal artery, that in turn, receives blood from various basins (spinal basin, radicular arteries basins, etc.) The difference of vascular basins determines the borders of morphological changes of PVA that occur due to hypoxia and ischemia, that are not so uncommon during ante – and intra-natal periods.

Therefore, any child, that was born with any PVA pathology gradually manifests some abnormalities of development of the brain functions – motor, perceptive, intellectual, verbal and communicative. Abnormalities of development of the motor functions manifest as infantile cerebral paralysis, intellectual abnormalities manifest as oligophrenia, abnormalities of perceptive functions manifest as peri-natal poor hearing and worsened eyesight, verbal abnormalities manifest as developmental dysarthrias and dysphasias, communicative abnormalities manifest as reticence, lack of psycho-emotional inhibitions, autism.

Philosophy and conceptual basis of osteopathy, powerful stimuli of biomechanical, hydro dynamical effect, increase of vitality, the new level of response on all levels of the feedback system of the whole organism allows the system to effectively break free from its previous pathologic equilibrium, arrange new structures and connections – in another words, to initiate the new critical period, artificially re-creating the process of development, and optimal molecular and sensory influences. Analysis of vast clinical data has allowed observation of various active treatment of different cerebral structures, that assisted active maturation, and stimulation of central regulatory mechanisms. Plasticity and immaturity of children's nervous system presents good prerequisites to successful osteopathic treatment. Neurophysiologic researches, conducted on various groups of patients, provide very obvious proof of substantial improvement of cerebral and peripheral blood circulation already at the initial stages of treatment, the electroencephalography data was also much better, in cases of myomalacia or cysts formations in the periventricular space among infants the reparative process was much shorter.

The most interesting patients were organized into the group of 624 children, they were aged 0-12 months, and 30% of them were diagnosed with peri-natal encephalopathy. The most common among them was combination of ante-peri-natal brain injuries (peri-ventricular myomalacia, cyst formations)

with structural intraosseous suture injuries, and peri-natal injuries of cervical area – rotational subluxation of the atlas vertebrae and condyle compression. This resulted in vital functions abnormalities, manifestation of jugular foramen syndrome, abnormalities of cerebral and spinal blood circulation syndromes, with the subsequent abnormality of differentiation of neurons, processes of myelinogenesis, and central regulatory function of the central nervous system. It has further resulted in developmental abnormalities of the motor system as pyramidal, cerebello and spinal insufficiency of various degrees. Early decompression of condyles insures decompression of cranio-sacral area, optimal hydrodynamics, and first of all – restoration of vital functions.

Infants, whose laboratory results indicated intrauterine infection were organized into a separate group. They were characterized by low vitality, their vitally important reflexes were low – the sucking reflex, apnoea, weak reaction to hunger, wet nappies in the first place. Hypotrophy, muscular hypotonia, bowels atony, enzymatic insufficiency were also frequently observed. Osteopathic treatment was able to manifest tangible results immediately – vitally important and neuro-trophic functions and immune response functions were activated literally after the first session. The infants were gaining weight rapidly, activity of cardio-vascular, respiratory and gastro-intestinal systems. Quite often there were observed such side effects of treatment as exacerbation of diathesis, disbacteriosis. In infants with jaundice, after liver drainage skin color and bowl color was affected. All those phenomena had active reducing tendencies, and had very positive immune-biologic character.

Minimal brain dysfunction, manifesting in 2-6 year old children as scattered neurological has in its basis developed periventricular leukomalacia with prolonged residual phenomena, widening of the ventricular system, unfinished neuron differentiation and myelinization processes. Most often, this manifests in children with hypo- and hyper-dynamic syndromes, behavioral disorders, pre-scholar and scholar dysadaptation. Neurological symptoms, as a rule, were correspondent to certain patterns of osteopathic injury. Constantly positive results were obtained after treatment of neurotic-like disorders, enuresis, encopresis, attraction disorders, pathological habits. All of those symptoms accompanied organic central nervous system injuries, and they were often combined with hypertension syndrome. Obvious positive results of osteopathic treatment were achieved with the treatment of developmental intestine disorders, that were diagnosed by surgeons are confirmed by x-ray. The treatment allowed to restore peristaltic and evacuator intestine function as well.

The most interesting group among the observed was the group of children with disorders of communication: Kanner's syndrome (57 children), sensor-motor disorder (19 children), motor alalia (56 children), dysarthria (187 children).

Children with early schizophrenia were exhibiting total introversion with absolute refusal to socialize with the other children, loss of previously acquired capabilities, anorexia etc. In this case, connection between their communication disorder and osteopathic injuries was not very obvious, although after osteopathic treatment there was observed definite regress of symptoms, such as much better communication with their relatives and anorexia reduction. Productivity of treatment was not always dependent on the age of a child, but always was dependent on how polymorphous his/her neural connections are. Questionable treatment result was observed in the case of malignant progression of

early form of schizophrenia (5-year old child), perhaps due to insufficient treatment. Considerable part of children with autism had gross membrane limitations, did require prolonged treatment, but nevertheless, they manifested stable progressive clinical results with gradual adaptation to ordinary, non-specialized children daycare or junior school – depending on their age. Apart from this, those children were gifted in many areas. Reduction of pathological symptoms was manifesting itself after the first sessions of treatment: children were able to establish eye contact, motor and verbal negative stereotypes were vanishing. Stubborn echolalias were replaced with the normal speech, anxieties and fears were lessening. Autistic children with obvious membrane limitations were characterized with extreme sensitivity, negativity, hyperactivity and high difficulty of establishing of psychological and manual contact. The treatment was periodical, extended over period of 2- 2.5 years, and inevitably lead to stable social adaptation, and possibility of study in a usual, non-specialized school. As an example, let us examine the history of the following patient: “Nikita, 6-year old boy, diagnosis – atypical autism. Parents complain about his non-adequate behaviour, communicational difficulties. Also, experiences difficulties with social adaptation, verbal stereotypes (echolalias), describes himself as a third person, experiences non-grounded fears. Playing activities are stereotypical, inclined towards collecting candy wraps. Gradually, after some osteopathic treatment verbal skills have improved, his speech has become more sensible, his abilities to adapt himself society and follow instructions have increased. Currently, this boy has successfully finished the first year of junior school, shows above average talent in mathematics, he is also good in drawing, clay modeling.”

Even better results were obtained with the treatment of speech abnormalities – motory, senso-motory alalias, dysarthrias. Those abnormalities were accompanied by rotational subluxation of Atlas vertebrae to the left in right handed children, and to the right – in left handed children – with correspondent skull deformation, often –internal rotation of frontal bone, temporal bone compression, membrane limitations. In our opinion, this connection of Atlas vertebrae rotation with the dominant brain hemisphere signifies intrauterine origin of excessive pressure in the rotator moment of the act of birth. Clinical observation: Sergei, 4,5 years old, diagnosis – sensomotory alalia. Atlas vertebrae is subluxated to the left. Does not speak, has very limited perception and understanding of spoken words. Positive results of osteopathic treatment is manifesting gradually: after the first treatment his vocabulary consists of 40 words, after the first course treatment is completed – his vocabulary consists of 100 words, he is able to construct simple sentences, and able to understand and follow instructions. Significant improvement in verbal development was observed after two months of treatment completion. At present time this child is seven years old, his speech is correct, grammatically structured, he reads, makes three-digit calculations, draws, exhibits quite impressive musical talents. There also have been obvious results in treating children with behavioral and cognitive disorders. In our opinion, there are no difficult children, but there are children with problems. If a child’s behavior is impossible to correct with pedagogic means – osteopathic treatment can be very useful.

Integration of the brain, formation of its highest intellectual and communicative function is a long-term process – especially in the case, where there is a pathology, and this demands persistent and on-going treatment, periodical stimulation of the nervous system, and its transition into the phase of active anatomical and functional maturation. Supervising patients with infantile cerebral palsy (classic

orthopedic- neurological examinational methods used), it is most certainly possible to observe definite positive effect of treatment – and it is more evident in cases of early treatment. Especially important is the increase of intellectual activity, regulation of muscle tonus in the cerebral and spinal areas, that creates a solid basis for development of motor, cognitive and communicative activity, especially within the context of complex treatment, that was developed by Russian school: psychological and speech therapy, massage therapy, orthotics, etc. Therefore, osteopathic treatment is an active method, that affects natural processes of genetically pre-programmed neural genesis, and helps maturation and formation of new connections, and integration of the brain as a whole system.

Work with neurological patients demands thorough examination, precise formulation of a neurological diagnosis, well-considered decisions concerning cancellation of other methods of treatment – especially with treatment of epilepsy, and other such acute disorders.

Patients with neurologic disorders, according to their degree of injury, maturity of neural systems, and their integration level, demand prolonged observation, recurrent stimulation, and quite often they demand complex rehabilitation methods, that were developed by Russian school of neurology.

Osteopathic treatment is especially recommended when commonly accepted correction methods do not bear any results.

Sources:

Articles by Dr. L. Veselovskaya.