

## Correction of Sensorimotor Functions of Pre-Lingual Children with Cerebral Palsy in the Context of Lekoteka

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**Submitted:** Dec 26, 2013; **Accepted:** Jan 20, 2014; **Published:** Jan 24, 2014

**Abstract:** Abnormalities of mental and speech development in case of childhood cerebral palsy are substantially caused by the absence or deficiency of children's activity, lack of sensorimotor development, i.e. of motor and sensor components intercoordination. The necessity of an early serial impact beginning based on the safe functions results from the characteristics of childhood brain-its plasticity, universal ability to compensate disturbed functions and also from the understanding that child's first three years of life are the most optimum terms of sensorimotor skills and functional verbal system maturation. We have developed the program of sensorimotor functions stepped correction of pre-lingual children with infantile cerebral palsy. The content of the program is focused on the formation of life competences, significant for socialization of children affected by infantile cerebral palsy.

**Key words:** Special education • Cerebral palsy • Children with disabilities • Sensorimotor functions

### INTRODUCTION

The problem of infantile central palsy is rather pressing today. In the last 15 years there has been observed the tendency for increase of patients suffered from this disease. So, if in 1992 the incidence rate was equal to 0,17 cases per 1000 people, today in different regions of the country it makes from 2,5 to 8 cases [1, 2].

Infantile cerebral palsy (ICP) is non-progressive cerebropathy affecting those parts of brain that are responsible for movements and positions of the body. The disease appears at early stages of brain development [3-6].

Clinicians in their researches note that children with organic brain damage have a delay of psychomotor system development, in particular, at an early stage of ontogeny.

Motor, sensory and speech impairments become significant reasons of mental impairments, which arise due to a failure of practical experience of children with cerebral organic deficiency and small communicative experience as well.

The characteristic feature of infantile cerebral palsy dysmotility is that children are born with it and it is connected with sensory disabilities. In particular, it is the lack of one's own movements perception that can act

as the leading defect and be presented by a peculiar abnormal development of motility which without correction and compensation can become the reason of negative effect on the subsequent course of child's neuropsychic formation.

The process of all motor sphere formation of children with cerebral palsy is delayed or impaired: holding of head, ability to sit, stand, walk, manipulative activity. Motor defects may be expressed differently: they may be so heavy that the child is completely deprived of the opportunity to move freely; if the range of motions is sufficient, the muscle tone is mildly disturbed there may be dyspraxia, self-care skills development is associated with difficulties.

Large variability of motor function formation in terms of time is connected with the form and severity of illness, intellectual parameter and time, when the regular therapy-the correction of impaired functions began.

**Early Sensory-motor Functions Correction of Children with Cerebral Palsy:** In recent years in Russia early children's cognitive activity and language behaviour impairment diagnostics has become the focus of increased attention. The early beginning of correctional and pedagogical work (during the first 3 years of life)

promotes the maximal use of compensation abilities of a child's body: brain flexibility, sensitivity to stimulate mental and speech development, ability to compensate impaired functions as the most optimum terms of sensorimotor skills maturation are the first three years of child's life [7].

Nowadays, early clinical diagnosis and correction of cerebral palsy is getting more and more into practice. As the foundation of child's cognitive function formation and general mental development is sensomotorika-intercoordination of sensory and motor components of activity, the particular importance of child's development in this direction should be noted. Despite the fact that in the first few months of life the pathology of pre-lingual development can be detected, development stimulation and abnormalities correction in most cases begin only in preschool years (after 3-5 years), when a persistent pathological stereotype of motor and mental disorders has been formed. Thus, the sensitive period of speech development, sensorimotor processes which falls on the first 3 years of child's life is missed. In this case, the work is mostly often aimed at the correction of already developed speech and mental defects instead of their prevention [8].

However, in Russia there has not been developed the stepped system of work aimed at the correction of sensorimotor functions abnormalities at an early age.

Not all rehabilitation centers in Russia are ready to accept infantile children with cerebral palsy. Some of them take children since the age of 3, others-with certain developed skills. Therefore, we often observe the situation when parents with young children having infantile cerebral palsy have nowhere to look for help; there are no specially created conditions for activities with them. And in this situation, Lekoteks are the most promising options of rehabilitation.

Russian model of Lekoteka was developed and introduced in Moscow in 2001 with the financial support of US agency for international development (AID of the USA) within the program "Help for orphaned children in Russia", which is carried out together with "Holt International Children's Services" and "Charities Aid Foundation".

Lekoteka is a service of psychological follow-up and specific pedagogical help for parents bringing up children with expressed abnormalities and problems of development. It implies weekly free individual activities for children with the logopedist, speech pathologist, psychologist [9].

The research conducted by us in 2011-2013 allowed to analyze the effectiveness of early sensorimotor functions correction of children with infantile cerebral palsy in the context of Lekoteka.

#### **The Content of Sensorimotor Functions Correction Program of Infantile Children with Cerebral Palsy in the Context of Russian Lekoteka:**

The analysis of author's methods, practical designs by E.F. Arkhipova, O.G. Prikhodko, M.B. Eidinova, E.N. Vinarskoy, E.S. Kalizhnyuk allowed us to develop sensorimotor functions correction program of infantile children with cerebral palsy, based on the creation of the complete compensatory impact system at early stages of the development.

The research goal is to work out a program aimed at sensorimotor sphere formation and development of infantile children with cerebral palsy, in particular, to create main forms and methods to form and develop the sensorimotor sphere in order to prevent pathological stereotype formation by the school age.

The hypothesis of the research: the early beginning of correction-developing work with children with cerebral palsy creates optimum conditions for sensorimotor sphere formation and development and promotes the due time and appropriate development of cognitive sphere and skills of social adaptation in case of physical activity limits in the context of Lekoteka.

We have developed the program of early stepped correction-developing work in relation to the conditions created in Lekoteka for the purpose of sensorimotor development stimulation of children with infantile cerebral palsy at an early age. Abnormalities of sensorimotor sphere, in turn, lead to changes of processes of an articulation, a sound pronunciation, control of facial expression and gestures, to changes of processes of kinesthetic perception, respiratory control and movement; life competences, significant in social adjustment of children having infantile cerebral palsy are not formed. All these immediately restrict speech activity and mental development in general. Speech as the main means of communication develops through movement and at social contacts and its basis is formed during a child's first year of life. Its most intensive formation is happening within the first 3 years of life. And therefore, formation of sensorimotor processes has to be one of the prime tasks of upbringing and teaching children with infantile cerebral palsy along with the complex work aimed at the development of motion activity; the necessity to stimulate and prevent abnormalities which are secondary in relation to disturbance of motor sphere is obvious.

The content of correction and logopedic work depends on the stage of a child's prelingual development. But as children of the same age can be at different levels of prelingual development because of unequal neurologic symptomatology and degree of abnormalities, specific features of development and conditions in which the child is brought up, at present there is no age periodization of prelingual development stages. And therefore, in the program developed by us the age criterion makes the basis of correctional developing work division into stages.

Correctional work represents a complex impact on cognitive, sensorimotor development, visual-active thinking stimulation which is carried out with children aged between 2 months to 3 years. The duration of stages at early terms of correctional work is equal to 3 months, further it is extended and makes 4-6 months.

Main objectives and aims of sensorimotor processes stimulation at an early age is the development of visual, acoustical, tactile and kinesthetic perception, formation of visual and hearing concentration, pursuit eye functions, sensor standards, visual-motor coordination, development of self-care skills, development of objective and manipulative activity, spatial inference, visual-active thinking, designing.

While working out individual correction-developing guidelines for a child having infantile cerebral palsy, we carefully study both disturbed and safe functions in order to take them into account in our further correctional work. We consider every child possibilities and work out the complex of exercises corresponding to the zone of their proximal development.

Correctional work carried out with children with infantile cerebral palsy, includes the following main stages: formation of motor system; development of fine motor skills; formation of sensory standards; development of cognitive processes; formation of subject-manipulative skills; formation of constructional skills.

It is impossible to realize aims without developing child's motion activity at the same time. This complex work is carried out in classes of swimming, during massage, on lessons with the instructor of physiotherapy exercises that help to reduce considerably the degree of movement disorder syndrome [9, 10].

At the lessons, the Lekotek staff use specific equipment to provide a steady pose, without imposing limitations on motoric activity monitoring components formation. It is thus important to keep the child in a pose

which to an increasing degree will promote relaxation of muscles, will interfere with manifestation of compulsive movements.

Classes are conducted in the form of a game as it is child's main activity supported by lekotek, in the process of game children obtain skills of common movements, fine motor skills and sensorimotor coordination. There is an opportunity to reach more complicated skills that demand well coordinated work of the whole group of muscles, to gain improvement of strength, balance, speed, control over the motion performance.

It should be noted that it is impossible to create a universal correctional program because apart from structure of the defect, degree of its severity, it is necessary to consider the time when it revealed itself, the level of inter-functional connections development, specific features of the development. Nevertheless, application of different traditional forms and methods of impact on the basis of Lekoteka within the frames of carefully planned correctional program, a combination of earlier beginning of developing activity with the integrated nature of impact will help to overcome many disadvantages in a child's personality development, to make the process of their integration into a society quite feasible.

## CONCLUSIONS

Results of the program evaluation showed that correctional activities within the framework of Lekoteka in the first 3 years of a child's life are most appropriate for sensorimotor skills formation and development as the early age is sensitive for sensorimotor sphere formation. Early detection of pathology and well-timed correction-pedagogical impact on an infantile and early childhood allowed to reduce and in some cases to exclude psychoverbal disturbances of children with cerebral paralysis at an older age.

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