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INDICATORS OF QUALITY OF LIFE OF CHILDREN WITH NATAL SPINAL INJURY IN SCHOOL-AGE CHILDREN AND WAYS FOR THEIR CORRECTION

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ANNOTATION

Perinatally caused pathology of the nervous system plays a major role in the formation of various disorders of the neuropsychic development of the child, which includes: motor deficits, speech disorders and higher cortical functions, headaches, epilepsy, school maladjustment (Lebedev M.A., 2011; Mendelevich B.D., 2010; Morozova E.A., 2012; Hamaoui A., 2010; Loram ID, 2011). According to WHO experts, the prevalence of vertebral deformities in children is 5.0-9.0%, and in the adult population it reaches 40.0-80.0%, which is associated with an underestimation of “minimal” neurological manifestations in children (Sitel A.B., Kuzminov K.O., 2010; Terentyeva O.S., 2012). Despite the imperfection of statistics, it is obvious that perinatal damage to the nervous system has recently taken first place in the structure of infant mortality (Morozova E.A., 2012). Most often, this is a functional pathology of organs and systems, caused by neurogenic disorders and the consequences of perinatal trauma (Chekalova S.A., 2011, Morozova E.A. 2012). The main task facing a practicing doctor is to choose the most effective set of treatment and rehabilitation measures for the purpose of improving the health of children and adolescents.

The study of quality of life (QOL) in medicine is a unique approach that allows you to fundamentally change the traditional view of the problem of health and comprehensively study indicators of a person’s quality of life, assessing all components of health - physical, psychological and social functioning (Lobanov Yu.F., et al. 2019). From the analysis of literature data, it follows that insufficient attention is paid to the study of health-related quality of life, and especially in children and adolescents, which contradicts modern world trends and the opinion of scientists. This is due to quite objective difficulties, the main one of which is the lack of tools that satisfy the internal needs of the country and comply with international requirements and approaches.

In the world, special attention is paid to a wide range of scientific research aimed at studying the modern approach to early rehabilitation of children and improving the quality of life with complications of birth injury of the cervical spinal cord and spine. All this indicates great prospects for research into the quality of life of children and adolescents, including the consequences of injuries to the central nervous system. The results of the study of the quality of life may be the necessary justification for the development and adoption of long-term

government programs to improve and create new conditions for the formation of the health of the younger generation. Knowledge about the attitude of parents to the health of children will help to build a comprehensive concept for strengthening their health, to carry out effective prevention of diseases and their complications.

All of the above prompted us to study the effectiveness of rehabilitation measures for children with the consequences of COFBIOTCSCAS.

The purpose of this study was to compare upper limb function and quality of life in school-age children with complications of birth injuries to the cervical spinal cord and spine.

Research methods: the study used clinical neurological examination and results of the PODCI scale, neurofunctional (electroneuromyography - ENMG), neuroimaging (ultrasound examination - ultrasound of the cervical segments of the spinal cord and spine).

The Pediatric Outcomes Data Collection Instrument (PODCI) was created to assess functional status, therapeutic needs, and post-treatment changes in children and adolescents aged 2 to 18 years with orthopedic problems. PODCI has three forms; parent form for children, parent and self-report forms for adolescents. The instrument includes 86 items assessing “upper limb and physical function”, “transfer and basic mobility”, “sports and physical function”, “pain/comfort”, “happiness”, “general functioning” and “expectations from treatment domains”.

Depending on the treatment, school-age patients were divided into two groups: the main group (n=28) - patients with COFBIOTCSCAS, who received standard therapy in combination with modeling of the musculoskeletal system using complex rehabilitation methods, namely electromyostimulation and kinesiotaping; comparison group (n=24) - patients with COFBIOTCSCAS who received basic standard therapy. The control group (n=32) consists of practically healthy children who underwent a medical examination at their place of residence in a family clinic.

Results and discussion. Upper extremity dysfunction is known to be the area that primarily reduces quality of life in children with COFBIOTCSCAS. This result highlights how difficult it is to manipulate objects with the upper limbs during certain activities, such as lifting heavy books, pouring milk, opening a previously opened can, using cutlery, combing hair, buttoning clothes, putting on a coat, and writing with a pencil. All of these may be related to the limited range of motion in these children, which is impaired by muscle weakness, simultaneous activation of antagonists, differences in the length of the affected limb, and contractures. Subsequently, children with COFBIOTCSCAS demonstrate limitations in performing functional tasks that are necessary for independence in daily activities and quality of life, as well as tasks requiring fine motor skills (for example, writing). To obtain reliable data, we studied quality of life indicators using the PODCI questionnaire in school-age children.

Table 1

Quality of life questionnaire results PODCI in school-age children

Domains	Before rehabilitation		After rehabilitation	
	Main group (M±m)	Comparison group (M±m)	Main group (M±m)	Comparison group (M±m)
Upper limb function	74.74±2.70	74.18±1.52	96.35±1.62 *	82.12±1.28 ^ °
Basic mobility and transmission	51.39±1.05	50.94±2.69	94.43±0.96 *	69.1±2.42 ^ °
Sport	85.15±0.91	82.44±1.08	97.37±0.81 *	87.5±0.81 ^ °
Comfort/pain	45.15±1.9	48.48±2.69	88.2±2.39 *	65.85±2.44 ^ °
Happiness function	60.09±2.57	61.32±2.61	92.5±1.02 *	72.2±2.42 ^ °
Global function	64.0±0.81	63.98±1.58	94.16±1.07 *	71.12±1.31 ^ °

Note: * - reliability of data before and after treatment in the main group (* - P <0.05)
^ - reliability of data before and after treatment in the comparative group (^ - P <0.05)
° - reliability of the difference after rehabilitation between the main and comparative groups (° - P <0.01)

Table No. 1 presents the results of data on quality of life in school-age children according to the questionnaire PODCI. It should be noted that the data of the children of the compared groups before rehabilitation did not have a statistically significant difference, which indicates the equivalence of the groups. The rehabilitation measures carried out had a significant positive trend in the studied indicators. It was found that the function of the upper limbs in children of the main group increased significantly. So, if before rehabilitation this indicator was equal to 74.74±2.70, then after treatment this indicator significantly increased and became equal to 96.35±1.62. It should be noted that this function also significantly improved in children of the control group - 74.18±1.52 and 82.12±1.28, but it was significantly lower (P<0.01) than in children of the main group.

The results of the studies showed that the domain “Basic mobility and transfer” in children of the compared groups also had its own characteristics. The treatment contributed to a significant improvement in performance. So, if in children of the main group this parameter was 51.39±1.05, then after treatment it increased to 94.43±0.96. Rehabilitation measures contributed to the improvement of this indicator in children of the control group: 50.94±2.69 and 69.1±2.42 ^° , respectively. However, the effectiveness was still significantly lower than that of children in the main group - 69.1±2.42 and 94.43±0.96, respectively.

An almost identical situation was observed in the children of this group in the “Sport” domain. As can be seen from the table, after the rehabilitation measures were taken, this indicator increased significantly. So, if before rehabilitation this domain was equal to 85.15±0.91, then after treatment it significantly increased and became equal to 97.37±0.81. After the treatment, the indicators of the children in the comparison group also improved, but not to the same extent as in the children of the main group. Consequently, it can be noted that the rehabilitation measures carried out to the children of the main group turned out to be more effective.

The indicators for the Comfort/Pain domain turned out to be even more clear than the previous indicators. Thus, in the children of the main group, before rehabilitation measures, the domain was equal to 45.15±1.9 and during treatment it increased to 88.2±2.39. The treatment

also contributed to a significant increase in children from the comparison group – 48.48±2.69 and 65.85±2.44, respectively, but still significantly lower than in the main group.

Interesting data was obtained for the "Happiness Function" domain. Treatment significantly increased the value of this parameter. Before treatment in children of the main group it was 60.09±2.57, and after treatment - 92.5±1.02. Despite the increase in this indicator in children from the comparison group, it was still significantly lower. Than in children of the main group (P<0.01).

Rehabilitation measures had a more pronounced increase in the "Global Function" domain in the main group. Thus, before treatment, this indicator in children of the main group was 64.0±0.81 and did not differ significantly from that in the comparison group - 63.98±1.58. After treatment, this domain increased in both the main and comparison groups – 94.16±1.07 and 71.12±1.31, respectively. However, in the main group, as the figures show, the improvement was more significant.

Thus, the studies showed that rehabilitation measures significantly improved the quality of life in school-age children. According to all parameters of the questionnaire PODCI, a more significant increase in all domains, without exception, was noted in children of the main group. It turned out that rehabilitation measures contribute to a faster restoration of vital functions, therefore, the quality of life of children depends on timely procedures.

The next stage of our work was to study the function of the upper limbs in school-age children with an assessment of the degree of effectiveness of the ongoing rehabilitation measures.

Table 2

Dynamics of upper limb function in school-age children

	Main group		Comparison group	
	Before treatment (M±m)	After treatment (M±m)	Before treatment (M±m)	After treatment (M±m)
Lift up heavy books?	66.67±3.55	95.83±2.8	64.05±3.63 *	92.64 ± 2.84 ^ ° _
Pour half liters milk eh ?	77.08 ±3.71	93.75 ±3.26	75.52±1.47 *	92.64 ± 2.84 ^ ° _
Open jar, which was open earlier?	75.0 ±3.07	95.83 ±2.8	76.47±2.59 *	80.88 ± 3.4 ^ °
Are you using fork _ And spoon?	79.16 ±4.16	100	77.05 ±2.94 *	86.47 ± 2.59 ^ ° _
Comb to him to her hair?	78.33 ±4.7	95.83 ±2.8	79.41 ±3.2 *	8 5.88 ± 3.4 ^ ° _
Button up ?	70.83 ±2.8	97.91 ±2.08	72.41 ±2.38 *	82.35 ±2.84 ^ °
Put on his /her coat ?	72.91 ± 3.71	95.83 ±2.8	75.0 ±3.03 *	79.47 ±4.53 ^ °
Write?	72.91 ±3.71	95.83 ±2.8	73.5 ±1.47 *	85.0 ±1.47 ^°

Note: * - reliability of data before and after treatment in the main group (* - P <0.001)

^ - reliability of data before and after treatment in the comparative group (^ - P <0.05)

° - reliability of the difference after rehabilitation between the main and comparative groups (° - P <0.01)

Table No. 2 shows the dynamics of the functions of the upper limbs of school-age children. We studied, first of all, the ability of children to carry out simple tasks; subsequently, the task was complicated in order to assess the individual capabilities of the children. The patients were divided into two groups depending on the treatment methods: the main group included children receiving special rehabilitation measures, and the second group included children receiving standard therapy.

The first question was formulated as follows: can p one heavy books and? Before carrying out rehabilitation measures, two-thirds of the parents surveyed responded positively, as in the main and comparison groups (66.67±3.55 and 64.05±3.63, respectively). The treatment measures carried out contributed to a significant increase in the capabilities of children in both groups, but still the best effect was obtained in children of the main group.

For an in-depth study of the dynamics of the functions of the upper limbs of school-age children, with the next question we wanted to find out whether the child could pour the floor liters milk eh? It turned out that three quarters of children in both groups had this ability before rehabilitation measures. The treatment increased the children's ability to 93% in both groups.

The results we obtained from a survey of parents about their children's ability to open jar, which was open earlier? – showed that children who suffered a cervical spine injury or spinal cord injury at birth are not always able to perform this function (75.0±3.07 in children of the main group and 76.47±2.59 in the comparison group, respectively). The treatment had a significant positive impact on the children's abilities. However, it should be noted that the effectiveness of various treatment methods had its own characteristics. Thus, in children of the main group who received special treatment methods, the ability to open jar, which was open earlier increased to 95.83±2.8 and had not only a significantly positive difference with the data before treatment, but also compared with the data of children who received standard therapy (80.88±3.4).

It is known that acquiring more precise movements requires not only more time, but also more preparation. In particular, learning to use a fork or spoon requires quite a lot of effort from a child. That is why we decided to find out the basic capabilities of a child who received a cervical spine injury or spinal cord injury at birth on this issue and evaluate the effectiveness of various treatment options for restoring this skill. It turned out that before treatment the question: does your child use a fork or spoon? - 79.16±4.16 parents of the main group answered affirmatively, and 77.05±2.94 - children of the comparison group. The implementation of special rehabilitation exercises exceeded all our expectations - 100 percent of parents said YES to this question, while in the comparison group the indicator became 86.47±2.59, which is significantly lower than in the main group .

The next question that we were very interested in was the ability to comb hair? It turned out that before treatment, the indicators of both groups did not have a statistically significant difference (78.33±4.7 in the main group and 79.41±3.2 in the comparison group). We were pleased with the result of treatment for children in the main group who received special rehabilitation measures - 95.83±2.8, while in the comparison group this indicator was not statistically different from the data before treatment and was lower than in the main group (85.88±3 ,4).

To the question: Will he be able to fasten buttons on his own ? - about three-quarters of the parents of both groups answered positively. Special rehabilitation measures contributed to the acquisition of this skill in almost all children of the main group - 97.91±2.08. The number of children who mastered this skill in the comparison group was 82.35±2.84. Therefore, children who have suffered a cervical spine injury or spinal cord injury at birth need to begin specially selected exercises to quickly return them to the physiological atmosphere of life and improve their quality of life.

Children who received a cervical spine injury or spinal cord injury at birth are usually very shy in groups. The slightest lag in the performance of vital functions contributes to increased depression, which further delays their physical and, especially, mental development. In this regard, it is necessary to find more advanced rehabilitation measures that promote the rapid restoration of lost skills to improve their quality of life. That is why we decided to first find out whether the child can put on a coat on his own ? It turned out that before treatment the indicators of both groups did not have a statistically significant difference (72.91±3.71 in the main group and 75.0±3.03 in the comparison group). After treatment in the comparison group, the indicator did not change - 79.47±4.53. The main group showed very good positive dynamics - 95.83±2.8.

We formulated the last question of interest as follows: Does he write independently with a pencil ? The answer to this question in the core group is very encouraging to us. If before special rehabilitation measures only 72.91±3.71 children could write independently, then after treatment this figure significantly increased and became equal to 95.83±2.8. Whereas in the comparison group, although the treatment increased this indicator, it was significantly lower than in the main group (85.0±1.47 and 95.83±2.8, respectively).

Conclusion. Thus, the results of the studies showed that school-age children who received trauma to the cervical spine and/or spinal cord at birth have significant impairments in the functions of the upper extremities. This was evidenced by the inability of children to perform elements of everyday functional tasks, such as, for example: lifting heavy books , ability to pour floor liters milk and oh opening banks, which has already been discovered before, the use forks And spoons, combing hair, buttoning, ability to put on coat o, write in pencil ashom. This, in turn, can negatively affect not only the mental state of children, but especially their quality of life. The special rehabilitation measures we used in our work, in contrast to standard treatment methods, significantly improved the functions we indicated above and thereby improved their quality of life.

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