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FEATURES OF POSTURE FORMATION IN CHILDREN OF KHANTY-MANSIYSK WITH SIGNS OF NONDIFFERENTIATED CONNECTIVE TISSUE DISPLASIA

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Abstract: In connection with the spread of undifferentiated forms of connective tissue dysplasia, it seems relevant to assess the impact of this pathology on the formation and disturbance of posture in school-age children living in the northern region. 208 schoolchildren of Khanty-Mansiysk were examined with a determination of the type of posture and external stigma of dysembryogenesis. Study participants with a number of stigmas from 0 to 5 were allocated to the comparison group (CG) (n = 66), the rest (6 and more) made up the study group (SG) (n = 143). A map was included for each subject, which included 43 signs of a hair dryer, with the definition of changes in the skeleton, skin and soft tissues, organ of vision, blood vessels. Assessment of posture was carried out with the division into the following types: normal, round back, flat and stooped back. According to the results of the study, undifferentiated dysplasia of connective tissue in children living in the northern region is much more common than in people living in temperate latitudes and affects the formation of pathological types of posture as an indicator of physical development with pronounced inter-gender differences.

Key words: nondifferentiated dysplasia of connective tissue, physical development, posture, far-north.

ОСОБЕННОСТИ ФОРМИРОВАНИЯ ОСАНКИ У ДЕТЕЙ С ДИСПЛАЗИЕЙ СОЕДИНИТЕЛЬНОЙ ТКАНИ, ПРОЖИВАЮЩИХ В СЕВЕРНОМ РЕГИОНЕ

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Резюме: В связи с распространением недифференцированных форм дисплазии соединительной ткани представляется актуальным оценить влияние данной патологии, на формирование и нарушение осанки у детей школьного возраста, проживающих в северном регионе. Обследовано 208 школьников г. Ханты-Мансийска с определением типа осанки и внешних стигм дисэмбриогенеза. Участники исследования с количеством стигм от 0 до 5 выделены в группу сравнения (ГС) (n=66), остальные (6 и более) составили группу исследования (ГИ) (n=143).На каждого обследуемого была заведена карта, которая включала 43 признакафена, с определением изменений со стороны скелета, кожи и мягких тканей, органа зрения, сосудов. Оценка осанки производилась с разделением на следующие типы: нормальная, круглая спина, плоская и сутулая спина. По результатам исследования недифференцированная дисплазия соединительной ткани у детей, проживающих в северном регионе встречается гораздо чаще, чем у проживающих в умеренных широтах и

оказывает влияние на формирование патологических типов осанки как показателя физического развития при выраженных межполовых различиях.

Ключевые слова: недифференцированная дисплазия соединительной ткани, физическое развитие, осанка, крайний север.

INTRODUCTION

In recent years, the number of children with negative changes in health status has increased markedly. It is known that an increase in the incidence of children occurs in school age [1, 2, 3, 14]. According to a large number of authors who conducted the research, no more than 10 % of current schoolchildren are almost healthy, and in other cases they have morpho-functional disorders or chronic pathology [2,7]. Violations of the musculoskeletal system [12] including disorders of posture [15] occupy a leading position among chronic diseases in children.

Posture is the usual pose of a laid-back person. It depends on the shape of the spine, the uniformity of physical development, and the tone of the muscles of the body. Correct posture has not only aesthetic, but also great physiological significance: it increases working capacity, affects the activity of internal organs, especially respiratory and circulatory organs.

The following types of posture are distinguished according to the classical Staffuffel posture classification scheme [9]: the first is normal posture. The physiological bends of the spine are well defined and have a uniformly wavy appearance. The second and third type of posture: flat or flat-concave back. The curvature of the spine is barely outlined; it has an infantile character. The elastic properties of the spine are reduced. The fourth type of posture is a round back. Its main characteristic is an increase in physiological kyphosis of the thoracic region and an increase in compensatory lordosis of the cervical and lumbar regions. The elasticity of the spine is increased. The fifth type of posture is a stooped back. Thoracic kyphosis dominates, the remaining curvatures are poorly marked. In addition, postural disorders can be noted in the frontal plane. This is, first of all, scoliotic posture.

Various postural pathology pathologies are found in most school-age children (89.7 %) [8]. They are mainly represented by functional disorders (46.9 %) and 1st degree scoliosis (38 %), while complex deviations of the shape of the dorsal surface of the body are more common in two (42.6 %) and three (14.6 %) planes, the predominant are changes in the sagittal plane, both isolated and combined, which is the main motivating factor for the development of structural changes in the spine and a favorable background in which diseases of the internal organs develop [7,12].

A lot of publications have been devoted to undifferentiated connective tissue dysplasia, including associations with disorders of the musculoskeletal system [4,5,6], including in extreme climatic conditions [13]. A combination of factors such as climate, incomplete adaptation, lifestyle significantly affect of the type, posture of children, as well as the development of pathologies such as spinal deformity, especially in combination with undifferentiated connective tissue dysplasia.

GOAL OF THE STUDY

To study the age- and sex-depenent characteristics of posture formation in children with undifferentiated dysplasia of connective tissue living in the Northern region.

OBJECTS AND METHODS

The study involved 208 children aged 7 to 17 years, of which 143 were boys and 65 were girls. To study age-related features, we used the scheme of periodization of postnatal ontogenesis of humans, adopted at the VII All-Union Conference on the problems of age-related morphology, physiology, and biochemistry of the USSR Academy of Pedagogical Sciences (Moscow, 1965) [11]. The period of the second childhood included 105 boys and 43 girls, the adolescent period included 38 boys and 22 girls.

The study was conducted on the basis of secondary schools in Khanty-Mansiysk. The examined children, mainly representatives of the Caucasian race, were natives of the northern region in the 1st and 2nd generations. For all examined, voluntary informed consent was obtained for the survey and anthropometric studies, signed by the parents.

Criteria for exclusion from the study: the presence of hereditary diseases, mental illness with a personality change, the presence of acute or exacerbation of chronic somatic diseases at the time of the examination, cancer, lack of informed consent of the parents.

Assessment of phenotypic manifestations of connective tissue dysplasia was carried out according to the M.J. map option. Glesby (1989) [17] and OnufriychukYu.O. et al. (2009) [13]. A map was created for each subject and included 43 signs-hair dryer, with the definition of changes in the skeleton, skin and soft tissues, organ of vision, blood vessels.

Study participants with a number of stigmas from 0 to 5 were allocated to the comparison group (CG) (n = 66), the rest (6 and more) made up the study group (SG) (n = 143). The age and sex composition of CG and SGare presented in table 1.

Assessment of the type of posture was carried out according to the method of Kovalkova (1962) [10] with the division into the following forms of posture: normal, round, flat, round-concave.

RESULTS AND DISCUSSION

The number of children with undifferentiated connective tissue dysplasia (NSTD) (6 or more stigmas of dysembryogenesis) in our study was 142 children (68.2 %). The literature contains data on the different prevalence of NCTD in the Russian population, which varies from 8–9 % to 26–30 %. According to I.A. Viktorova [4], NCTDis observed with a frequency of 26 to 80 %, including 53.5 % of children and adolescents 7–17 years old. In young people in the southern latitudes of Russia — from 13 % to 35–60 % [6]. The prevalence of NCTD in adolescents of the indigenous and alien populations of the Amur Region is 63.0 % [5].

The distribution of posture among children of Khanty-Mansiysk with NCTD is as follows (table. 2)

Normal posture had 50 (67.57 %) boys and 11 (44 %) girls of the second period of childhood. The most common type of deviation from normal posture in boys was a flat back, which was recorded in 13.5 % of cases. Such forms as the round-concave and round back in boys of the second childhood period accounted for 10.8 % and 8.11 %, respectively. 58 % of girls of the second childhood period had changes in posture, among which the round — in 28 % and round-concave — in 20 % of cases, the back shape was mostly recorded. A decrease in physiological bends in the form of a flat backwas recorded in 8 % of girls of this age.

Children of adolescent ontogenesis were characterized by a slightly different ratio of posture types. The most common types of posture during this age period were the normal type, registered 45.5 % of boys and 63.6 % of girls, as well as a round back — found in 36.4 % of girls and 27.3 % of boys. Such types of posture as round-concave and flat backs were determined only in adolescent developmental boys in 15.2 % and 12.1 % of cases, respectively.

Thus, it was found that the occurrence of the normal type of posture in girls with NCTD increases from the second childhood to adolescence, and in boys, on the contrary, it decreases. The most common type of posture disorder in children of the study group is the round back, which is found in a third of girls of both age periods and a quarter of adolescent boys.

In children of the comparison group, when studying the features of posture formation, the following data were obtained (table 3).

Normal posture was recorded in 67.7 % of boys and 50 % of girls of the second childhood period. Of the types of posture

Table 1

Age and gender composition of study groups (SG) and comparisons (GS) of children of Khanty-Mansiysk

Groups	General group		Second childhood period		Adolescence	
	Boys (n=143)	Girls (n=65)	Boys (n=105)	Girls (n=47)	Boys (n=38)	Girls (n=18)
SG (n=142)	106 (74,65 %)	36 (25,35 %)	74 (70,48 %)	25 (53,19 %)	32 (84,21 %)	11 (61,11 %)
CG (n=66)	37 (56,06 %)	29 (43,94 %)	31 (29,52 %)	22 (46,80 %)	6 (51,79 %)	7 (38,88 %)

Table 2

Age and sex features of the formation of posture in children with NCTD (SG)

Posture	Study group (n=143)			
	Second childhood period		Adolescence	
	Boys (n=74)	Girls (n=25)	Boys (n=33)	Girls (n=11)
Normal	50 (67,57 %)	11 (44 %)	15 (45,45 %)	7 (63,64 %)
Round	6 (8,11 %)	7 (28 %)	9 (27,27 %)	4 (36,36 %)
Flat	10 (13,51 %)	2 (8 %)	4 (12,12 %)	0
Roundconcave	8 (10,81 %)	5 (20 %)	5 (15,15 %)	0

Table 3

Age and gender features of posture formation in children of Khanty-Mansiysk without NCTD (CG)

Posture	Comparison group (n=66)			
	Second childhood period		Adolescence	
	Boys n=31	Girls n=22	Boys n=6	Girls n=7
Normal	21 (67,74 %)	11 (50 %)	3 (50 %)	2 (28,57 %)
Round	2 (6,45 %)	2 (9,09 %)	0	0
Flat	3 (9,68 %)	2 (9,09 %)	2 (33,33 %)	0
Round concave	5 (16,13 %)	7 (31,82 %)	1 (16,67 %)	5 (71,43 %)

disturbance, the most frequently encountered round-concave shape of the back at this age (in 31.8 % of girls and 16.1 % of boys). Flat back was recorded in 9 % of boys and girls of the second childhood period. 6 % of boys and 9 % of girls of this developmental period had a round-concave type of posture.

In adolescence, a decrease in the number of persons with a normal form of the back (50 % of boys and 28.7 % of girls) was found, with their redistribution into groups with impaired posture. 71.4 % of girls and 16.7 % of boys had a round-concave shape of the back. Flat back was recorded only in 33.3 % of adolescent boys. There were no other forms of postural dysfunction in adolescent children.

CONCLUSION

The frequency of occurrence of undifferentiated forms of connective tissue dysplasia in children living in the northern region is much higher than in those living in temperate latitudes and affects the level of physical development. Boys with undifferentiated connective tissue dysplasia in adolescence have a greater number of people with impaired posture compared with a group of boys of the second period of childhood. In girls, it is most unfavorable, namely the second period of childhood, and in adolescence there is a decrease in the number of pathological types of posture. The qualitative features of postural disorders in children with undifferentiated connective tissue dysplasia are the formation of a round back.

The obtained inter-gender and age-related posture characteristics can serve as the basis for the development of primary and secondary prevention of its disorders and correction of the functioning of internal organs in children with undifferentiated connective tissue dysplasia.

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