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Psychomotor Development in Children With Thyroid Dysfunction

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Resume: The proposed method allows early diagnosis and prevention of disorders of psychomotor development in preschool children, which is of important medical and social importance. The article is devoted to the development of a scheme for predicting the psychomotor development of preschool children, which is of great importance for health authorities when organizing specialized pediatric and medical-pedagogical, preventive services.

Keywords: Children, psychomotor development, thyroid gland,preschool age, anthropometry

Introduction.

Psychomotor development is a complex process that reflects the maturation of the central nervous system (CNS) and is influenced by numerous biological and environmental factors. One of the critical regulators of early brain development is the thyroid gland. Thyroid hormones are essential for the proper growth and differentiation of neurons, myelination, and the establishment of synaptic connections. Thyroid dysfunction during critical periods of development can result in significant delays in motor and cognitive milestones, affecting the overall quality of life and intellectual potential of the child [1,2].

During the fetal period, the fetus is highly dependent on maternal thyroid hormones. Postnatally, the child's own thyroid function becomes crucial. Deficiency in thyroid hormones, even temporarily, can lead to structural and functional brain abnormalities, especially if not corrected promptly [3].

Thyroid dysfunction in children—whether congenital or acquired—can significantly impair psychomotor development. Early diagnosis through neonatal screening, timely hormone replacement therapy, and regular monitoring of thyroid status are critical strategies to prevent long-term neurological and developmental consequences. A multidisciplinary approach, involving pediatricians, neurologists, and endocrinologists, is essential to ensure optimal outcomes for affected children [4-6].

The aim of the study was to develop a method for predicting the psychomotor development of preschool children.

Materials and methods of research:

A survey of 1,390 organized preschool children living in the Bukhara region was conducted. Of these, 721 are girls, 669 are boys aged 3-7 years. The analysis, depending on the place of residence, showed that there are only 667 children living in rural conditions, 313 of them boys (46.9%), 354 girls (53.1%). There are 723 children living in the city, including 356 boys (49.3%), 367 girls (50.7%). The ratio of urban and rural children was 1:1.

Results and discussion.

The results of the distribution of children by age and place of residence showed the predominance of organized children in preschool institutions at the age of 4-6 years, regardless of the place of residence (fig.1).

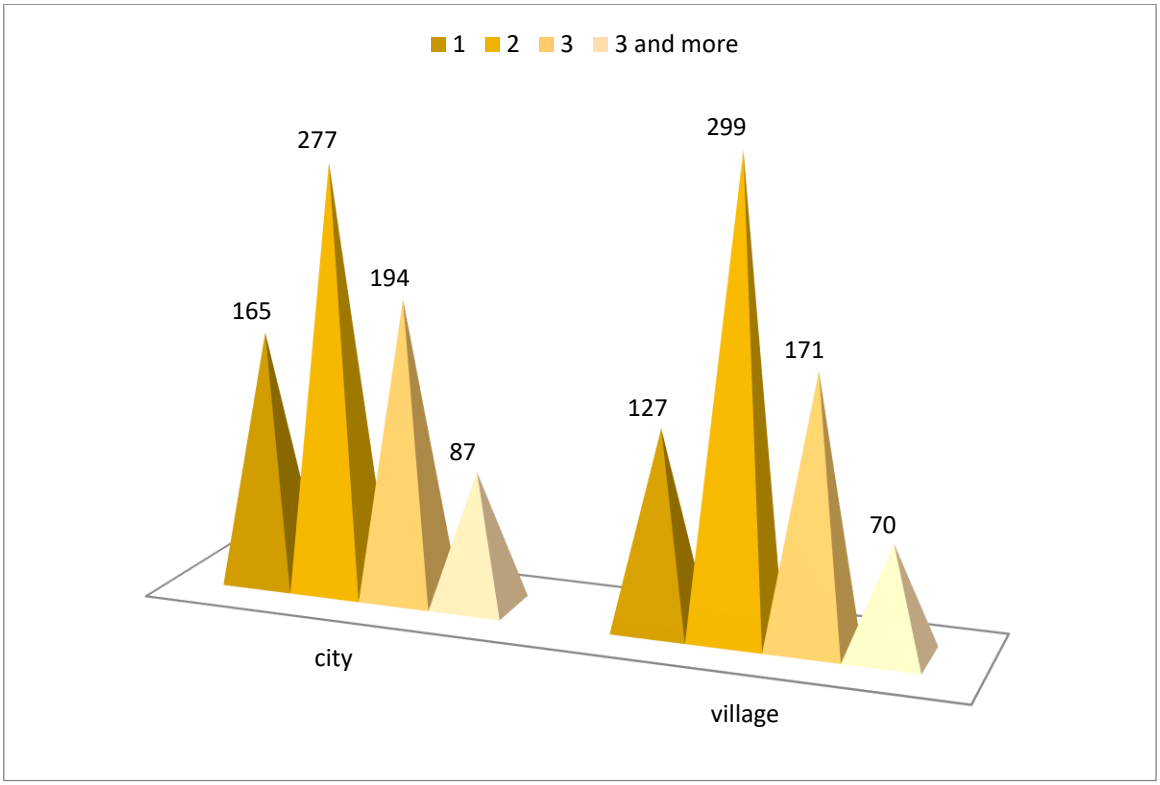

Figure 1. The frequency of morbidity of children depending on the place of residence

The analysis of the children's health status allowed us to establish the frequency and structure of their morbidity. The structure of morbidity of children living in the city is dominated by infectious diseases, diseases of ENT organs, endocrine, neurological and allergic diseases.

At the same time, the frequency of morbidity of children depending on the place of residence shows that, regardless of the place of residence, organized preschool children get sick 2 times a year.

The study of the physical growth of preschool children showed that 4-year-old girls are ahead of boys in height, weight, chest circumference and leg length.

At the same time, boys' average physical development indicators were at the level of weight - 14.9±0.24 kg compared to girls' weight -15.8±0.24 kg ($p<0.05$). The height of 4-year-old boys was 95.7± 0.70 cm compared to the height of girls -99.4± 1.19 cm ($p<0.05$). During the analysis, a statistically significant large breast circumference was found in girls-56.1± 0.31 cm against the indicators in boys - 53.1±0.31 cm ($p<0.05$). And also the length of the legs in girls was -55.3 ± 0.49 cm against the length of the legs in boys -50.3 ± 0.23 cm, which shows the reliability of the results obtained by comparing the indicators of physical development of children aged 4 years ($p < 0.05$).

The results of the study showed that boys received a higher score on the psychomotor development assessment scale - 83.6 ± 1.91 points, compared to the data for girls of the corresponding age -81.5 ± 1.52 points. A more detailed study of morphometric parameters and thyroid hormones in 4-year-old children showed that in boys the length of the right and left lobes of the thyroid gland is greater than in girls, 2.7± 0.09 cm and 2.4 ± 0.05 cm, respectively, ($p <0.05$). At the same time, the volume of the left lobe of the thyroid gland in boys is 2.0 times greater than in girls: 1.2 ± 0.13 cm and 0.6 ± 0.04 cm ($p<0.05$).

Analysis of the state of thyroid hormone synthesis showed higher titers of free T4- 25.7±0.72 pmol/L and TSH- 2.4±0.21 pmol/L in boys versus data in girls, 19.1±0.91 pmol/L and 1.4±0.09 pmol/L, respectively ($p<0.05$),

Evaluation of thyroid hormone synthesis allowed to establish an increase in the level of total T3 in girls to 2.7± 0.14 mmol/l compared to its synthesis in boys - 2.0± 0.15 pmol/l ($p<0.05$).

Thus, the results of the study made it possible to establish the features of psychomotor and physical development in children aged 4 years, depending on gender. It was found that girls of 4 years of age are ahead of boys in height, weight, chest circumference and leg length. At the same time, the length of the right and left lobes of the thyroid gland is greater in boys than in girls, the volume of the left lobe of the thyroid gland is 2.0 times greater than in girls ($p<0.05$). And also revealed an increased synthesis of T4 and TSH in boys, and in girls - an increase in the level of total T3.

Consequently, in girls, an increase in the level of total T3 indicates a lack of iodine in the body and a high risk of developing endemic goiter.

Based on the results of a study of children aged 4 years, it was concluded that in children aged 4 years, the functional state of the thyroid gland does not depend on the indicators of physical development. Girls at the age of 4 have a high risk of developing endemic goiter due to iodine deficiencies in the body, which shows the importance of taking into account the diet and ensuring the intake of iodine in the body with food in preschool institutions.

Thus, a comprehensive assessment of the physical and psychomotor development of children with morphometric indicators of thyroid and the state of synthesis of its hormones in children, depending on age, made it possible to determine their age-sexual characteristics and predict the risk of developing thyroid diseases.

Conclusion:

1. The prevalence of organized children in preschool institutions (DDU) at the age of 4-6 years has been established, regardless of the place of residence
2. It was found that girls of 4 years of age are ahead of boys in height, weight, chest circumference and leg length. At the same time, in boys, the length of the right and left lobes of the thyroid gland is greater than in girls, the volume of the left lobe of the thyroid gland is 2.0 times greater than in girls ($p<0.05$).
3. Increased synthesis of T4 and TSH was found in boys, and in girls - an increase in the level of total T3 at the age of 4 years. An increase in the level of total T3 in girls indicates a lack of iodine in the body and a high risk of developing endemic goiter.
4. In children aged 4 years, the functional state of the thyroid gland does not depend on the indicators of physical development.
5. There is a high risk of developing iodine deficiency in girls at the age of 5 years, which is clinically manifested by the lag of girls in growth against the background of the tendency to gain weight, lag in the growth of the circumference of the head and chest, the length of the arms and legs compared to the physical growth of boys.

References

1. Delange, F. (2001). Iodine deficiency as a cause of brain damage. Postgraduate Medical Journal, 77(906), 217–220. https://doi.org/10.1136/pmj.77.906.217
2. Rovet, J. F. (1999). Congenital hypothyroidism: long-term brain development and intellectual outcomes. Thyroid, 9(7), 741–748. https://doi.org/10.1089/thy.1999.9.741
3. Zimmermann, M. B. (2011). The role of iodine in human growth and development. Seminars in Cell & Developmental Biology, 22(6), 645–652. https://doi.org/10.1016/j.semcdb.2011.07.009
4. Bongers-Schokking, J. J., & de Muinck Keizer-Schrama, S. M. (2005). Influence of timing and dose of thyroid hormone replacement on mental, psychomotor, and behavioral development in children with congenital hypothyroidism. The Journal of Pediatrics, 147(6), 768–774. https://doi.org/10.1016/j.jpeds.2005.07.025

5. Ш., Ганиева Ш., Б. Б. Рустамов, Паноев Х. Ш. «Региональные особенности частоты и клиники респираторной аллергии». *New Day Med* 3 (2021): 35.
6. Ganieva Sh.Sh., Ergasheva M.U., Panoev Kh.Sh. Immuno-inflammatory markers of syntropic cardiovascular diseases. *Medical Immunology (Russia)*. 2023;25(4):933-938. https://doi.org/10.15789/1563-0625-IIM-2763