RELATIONSHIP BETWEEN ANTHROPOMETRIC INDICATORS AND THE RISK OF METABOLIC SYNDROME IN SCHOOLCHILDREN OF THE REPUBLIC OF KARAKALPAKISTAN

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Introduction

Metabolic syndrome (MS) in children and adolescents is a combination of risk factors predisposing to the development of cardiovascular diseases and type 2 diabetes mellitus. The main components of MS are abdominal obesity, insulin resistance, arterial hypertension and dyslipidemia. In recent decades, there has been an increase in the prevalence of MS among children, which is associated with an increase in obesity and a sedentary lifestyle [2].

Studies show that the presence of abdominal obesity in children and adolescents is an important predictor of the development of metabolic disorders. Obesity, especially visceral obesity, is characterized by the accumulation of adipose tissue in the abdominal area, which leads to impaired lipid and carbohydrate metabolism, and contributes to the development of insulin resistance and arterial hypertension [3]

Body mass index (BMI) is traditionally used to assess body weight status, but for a more accurate assessment of the risk of metabolic syndrome, it is also important to take into account such indicators as waist circumference, waist-to-hip ratio. These parameters help to more accurately assess the distribution of fat in the body and the risk of developing metabolic diseases associated with obesity [1]

Thus, the relationship between anthropometric indicators and the risk of metabolic syndrome in children and adolescents is an important topic for further research. The development of effective methods of prevention and treatment based on monitoring these indicators will help reduce morbidity and improve the health of future generations.

The aim of this study is to assess the relationship between anthropometric indicators (height, body weight, body mass index (BMI)) and the risk of developing metabolic syndrome in children and adolescents.

Materials and methods

The study involved 311 children, including 200 boys and 111 girls, aged 11 to 15 years in the Republic of Karakalpakstan from comprehensive schools in Nukus and Kungirad district. All participants were divided into two groups based on their health status and body weight indicators. The first group included 157 overweight and obese children and adolescents (101

boys and 56 girls). To determine this category, standard criteria based on the body mass index (BMI) were used, according to which children with a BMI above 25.0 were considered overweight, and with a BMI above 30.0 - obese. Therefore, the average body mass index of children and adolescents in the first group was BMI 29.1 ± 0.702 for boys and 29.4 ± 0.863 for girls. The second comparison group included 154 children and adolescents with normal body weight, whose BMI values were within the normal range for boys BMI - 18.1 ± 0.389, for girls 18.3 ± 0.579. These children did not have problems with excess weight and obesity, which allowed them to be used as a control group for comparison. The following parameters were measured to analyze physical indicators. Height (m) was measured using a stadiometer with an accuracy of 0.1 cm. For each participant, height was recorded without shoes, in a standing position. Body weight (kg) - measured using standard medical scales with an accuracy of 0.1 kg. Children stood on the scales without outerwear and shoes. Body mass index (BMI) - calculated using the formula: BMI = Body weight (kg) / Height (m2). BMI was used to classify children into groups with normal body weight, overweight and obesity. These measurements were taken at the same time of day for all participants to minimize the influence of daily fluctuations in body weight and other factors. All measurements were taken by experienced specialists in a medical facility, which ensured the accuracy and reliability of the results. Descriptive statistics were used to assess differences between groups, and the statistical significance of differences for data with a normal distribution was assessed using Student's t-test for dependent samples. The data obtained as a result of the study were calculated by statistics using a Lenovo V15-IGL personal computer using Microsoft Office Excel 16.

Results and discussion

The results of our study show statistically significant differences between the groups of children and adolescents suffering from obesity and their healthy peers. In the main group, which includes children with obesity, the average BMI was 29.1 ± 0.70 in boys and 29.4 ± 0.86 in girls. These values correspond to the obesity class, which indicates the presence of significant overweight in children in this group. A BMI value above 30 is the standard for diagnosing obesity. In the group of healthy children, the BMI was significantly lower, which corresponds to the normal weight range for this age. In boys in this group, the BMI was 18.1 ± 0.39, and in girls - 18.3 ± 0.58. These values are within the normal range for children of this age, indicating adequate growth and development of body weight. Dynamics of changes in height by age: in the main group of children with obesity, height also increased with age, but this process could be somewhat slower in some children, which is typical for obesity, since it can affect the normal development of the body. In 15-year-old boys, the average height could be about 170-175 cm, and in girls - about 160-165 cm. However, the exact data depends on the individual characteristics of the children and the level of obesity. In this group, the height

could be slightly lower than in healthy children due to possible developmental abnormalities associated with obesity (for example, hormonal imbalances, excess body weight, which can affect physical development. In the group of healthy children, the height increased more stably and harmoniously as they grew older. In this case, physiological development was within the normal range, and the children's height corresponded to age standards. For 15-year-old boys, the average height could be approximately 175-180 cm, and for girls - about 165-170 cm, which is normal for this age. The height in this group was more predictable and corresponded to the age norm, since the children did not suffer from excess weight, which can slow down or disrupt the normal development of the body.

Conclusion

The results of the study show a significant difference in BMI and body weight between the group of children with obesity and the group of healthy children. In the first group, there is pronounced obesity with a high BMI, while in the second group, BMI and body weight are within the normal range. Comparison of body weight and growth dynamics in children with obesity and in healthy children allows us to conclude that obesity in the main group is a serious problem that requires medical intervention and lifestyle correction.

References

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