

OBESITY AND DIABETES IN CHILDREN AND ADOLESCENTS

Ochildiyev Mukhiddin Khusin ugli
Tashkent Medical Academy, Urganch Branch,
Faculty of Endocrinology, 1st year master

Rahmetova Malika Rahimovna
Candidate of Medical Sciences, Docent

ABSTRACT

Obesity is a multifactorial disease. The purpose of the study was to study the etiological factors contributing to the formation of obesity in children and adolescents. Two groups of children were examined. Observation group: 101 obese children aged 10 to 17 years, with a body mass index (BMI) of 31.27 ± 0.51 kg/m²; comparison group of 14 children aged 10 to 17 years, without obesity, BMI 18.54 ± 0.11 kg/m².

Keywords: obesity, method, heredity, treatment, hypokinesia.

INTRODUCTION

Currently, there are about 1.7 billion people on our planet who are obese, and their number is increasing. According to preliminary estimates, currently in the world at least 30% of the working population are overweight and 25% are obese [1]. There has been a steady increase in excess weight in children and adolescents, which allows us to potentially predict a sharp progression of obesity in the future, since in almost 60% of adults obesity begins in childhood and adolescence [2]. The problem of excess body weight in young people is currently particularly relevant, since it is in this age group that the prevalence of complications associated with obesity (type 2 diabetes, cardiovascular diseases), included in the metabolic syndrome group, is rapidly increasing. [2].

MATERIALS AND METHODS

The study included 48 girls and 53 boys aged from 10 to 17 years, average age 13.35 ± 0.21 years. A study of perinatal and family history, an anthropometric examination was carried out, a calculation of excess body weight was made, physical and sexual development, and the functional state of the autonomic nervous system were assessed using standard cardiointervalography [1].

RESULTS AND DISCUSSION

In all children of the main group, the BMI value exceeded the 95th percentile and averaged 31.27 ± 0.51 kg/m², with a range of values from 23.5 to 47.2 kg/m².

The comparison group consisted of 16 children, aged 14.31 ± 0.63 years. The average BMI value in this group was 17.44 ± 0.47 kg/m², with a range of values from 14.2 to 20.4 kg/m². The difference in BMI in the two groups was statistically significant ($p=0.000$). In accordance with the stage of sexual development (according to Tanner), children with stage I made up a smaller proportion. At the time of the study, both in the observation group and in the control group, the

majority of children had reached stages IV–V of sexual development. When ascertaining the medical history, special attention was paid to hereditary burden of obesity and associated diseases: hypertension, type 2 diabetes mellitus (DM). 78.2% of children have close relatives who are obese, while in 56 children (55.44%) one of the parents was overweight, and 1.7 times more often these were mothers. In girls, heredity for obesity was aggravated in 79.16% of cases, in boys in 77.35% (Table 1).

Table 1 Family history of obese children and adolescents

Disease	Along the line %		On the father's side, %		Maternal relatives, %	
	boy	girl	boy	girl	boy	girl
Obesity	43,39	37,5	18,86	29,16	52,83	62,5
Hypertonic disease	16,98	20,83	9,43	2,08	20,75	14,58
Diabetes mellitus type 2	5,66	2,08	-	-	24,52	29,16

35.64% of children have relatives with hypertension, and 29.70% have relatives with type 2 diabetes. 27.72% of children have relatives suffering from obesity in combination with hypertension, 7.9% of people have relatives with obesity, diabetes and hypertension. Heredity in boys is more often aggravated on the maternal side than on the paternal side ($p=0.012$). Regression analysis revealed a relationship between the presence of obesity in the child and the mother's weight ($R^2 = 0.2044$, F coefficient = 4.317; $p = 0.040$).

A study of the history of early development revealed that 94 children (93.06%) had an unfavorable perinatal history. During the perinatal period, mothers of obese children more often had toxicosis compared to the comparison group ($p=0.015$). The course of pregnancy was complicated in 48.51% of cases by toxicosis, anemia in 18.81%, the threat of miscarriage was present in 16.83% of mothers, infection, dropsy and hypotension were detected equally often in 12.87%, chronic fetal hypoxia was diagnosed in 9.9% of cases. It is worth pointing out that 41.58% of mothers had a history of medical abortions. 16.83% of children were born by caesarean section, premature births were observed in 8.91% of cases. Women carried pregnancy to term with obesity in 4.95% of cases, and with type 2 diabetes mellitus – 1.98%. Regression analysis showed that there is a relationship between obesity in the child and the threat of miscarriage ($R^2=0.2500$, $F=6.601$; $p=0.011$), as well as the presence of hypertension in the mother during pregnancy ($R^2=0.2581$, $F =7.066$; $p=0.009$).

CONCLUSION

Childhood obesity can be seen as a family disease. Special attention is required for children who have relatives with MS factors, whose mothers had a pregnancy complicated by the threat of miscarriage, arterial hypertension, a history of abortion, and early artificial feeding. Obviously, obese patients demonstrate a significant hereditary burden for the main components of MS and are significantly more likely to experience the effects of physical inactivity and excessive hypercaloric nutrition, which potentiate the development and progression of obesity, and, consequently, metabolic syndrome. In addition, regardless of the degree of obesity in children, a hypersympathicotonic type of reaction of the nervous system is observed, which may be an additional factor in the formation of arterial hypertension as one of the components of the metabolic syndrome.

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