AMERICAN JOURNALS
Open Access, Peer Reviewed Journals

American Journal of Pedagogical and Educational Research
ISSN (E): 2832-9791| Volume 10, | Mar., 2023

STUDY OF THE MAIN RISK FACTORS OF DYSMETABOLISM IN CHILDREN OF PUBERT AGE

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A B S T R A C T	K E Y W O R D S
Currently, obesity is one of the urgent problems of clinical medicine. More than 1 million people in the world are overweight, and of these, 300 million are obese. Children with obesity suffer from various diseases much more often than children with normal weight. 55 children of pubertal age, patients with exogenous constitutional obesity and arterial hypertension were examined. Risk factors for the development of dysmetabolism in children have been identified. A relationship has been established between BMI, lipid and carbohydrate metabolism indicators with previously identified risk factors, as well as an inverse correlation between birth weight and BMI. These facts characterize low birth weight as a significant risk factor for the development of obesity and subsequent metabolic syndrome.	obesity, children, risk factors, body mass index, dysmetabolism.

Introduction

According to the World Health Organization, obesity is one of the urgent problems of medicine. According to statistics, every seventh inhabitant of the planet is overweight. Fat people suffer from various diseases much more often than people with normal weight. In 2010, 43 million children were overweight and obesity has reached epidemic proportions [1,3,7,9,11]. Along with obesity, there is a clear trend towards a steady increase in the conditions associated with it. Thus, arterial hypertension (AH) among children and adolescents ranges from 0.4 to 11%. The combination of obesity and hyperuricemia are factors in the progression of hypertension [2,4,5,8,10].

PURPOSE OF THE STUDY

To study the main risk factors for the development of dysmetabolism in children who have undergone hypoxia.

MATERIALS AND RESEARCH METHODS

55 children of pubertal age, patients with exogenous constitutional obesity and arterial hypertension were examined. The selection of patients was carried out according to body mass index (BMI) and waist circumference in children with obesity above 97 percentile, 25 girls (45%), 30 (55%) adolescent boys whose average age was 14.35 ± 0.21 years (from 10 to 18 years). The waist circumference was 99.82 ± 1.3 cm, the ratio of waist to hip volume (W/H) was 0.92 ± 0.009. 20 of them had normal blood pressure (group II A) and 18 children had a confirmed diagnosis of hypertension (group II B). Differences in the WC / OB ratio in groups I and II were significant (P0.85 in girls and >0.9 in boys is regarded as abdominal obesity. Total cholesterol and high-density lipoproteins (HDL) in blood serum was determined by an enzymatic method using a set of reagents "Novohol-A" company "Vector-Best". The level of triglycerides was determined by the enzymatic colorimetric method according to Gottfried and Rosenberg (1973) modified by N.L. Aslanyan et al., using the set of reagents "Triglycerides-Novo". Statistical processing of the results obtained was carried out using the Statistica 7.0 software package (StatSoft, USA).

RESEARCH RESULTS AND DISCUSSION

One of the risk factors for the development of obesity is low birth weight, as well as excess weight over 4000 g. Thus, the average body weight in patients was 13560.3±125.2 g, with a height of as in the control group, the average body weight of children was in the range of 10430.8 ± 108.2 g. These facts were confirmed by the BMI index, which was in the range of 20.1 ± 0.5 kg / m2 in children aged 1 year, which characterized the weight body as overweight, compared with the control group, where the BMI was 16.02±0.7 kg/m2. These indicators are presented in the table.

Table

Total, n=55	Weight	Height	IMT
1 group n=17	13560±125.2*g	82.4±2.1 cm	20.5 yam 0.5 * kg / m2
2a group n=20	12452±108.7 g	80.4±2.1 cm	19.5 AMA 0.2 kg / m2
2b group n=18	12960±155.1* g	80.5±2.1cm	20.1 AMA 0.5 kg / m2*
control group n=20	13980.3±101.5** g	81.1±0.9 cm	21.1 AMA 0.2 kg / m2**
Total, n=55	104300.8±108.2	79.1±1.3	16.02 AMA 0.7 kg / m2

Note: *significance P<0.005 in relation to the control. ** Significance P<0.005 in relation to the group with a uniform type of obesity.

28 children were born with asphyxia in 2, the condition on the Apgar scale was estimated at 4-6 points (50.9%). In 13 (23.6%) cases, pregnancy was Volume 3. Issue 1 (21), September 2021 88 premature, mothers with obesity 1-2 degrees of severity - 6 (33.3%) cases and more often in total, it was accompanied by type 2 diabetes mellitus, 2 (11.1%) mothers had a violation of glucose tolerance. Also, 19 (34.5%) mothers of obese children noted a significant increase in body weight during pregnancy with a uniform type of obesity. 20 (36.3%) children were exclusively breastfed up to 6 months, and 32 (61.6%) were on mixed and artificial feeding.

In the control group, 15 (75%) children received natural feeding up to 6 months and 5 (25%) – mixed and artificial. When analyzing the feeding of children by groups, it was revealed that the frequency of

exclusively breastfed children up to 6 months of life was 8 (47%), whereas in the group of children with abdominal obesity (AO), the frequency of breastfed children was 7 (35%). Heredity is one of the main non-modifiable risk factors for the development of obesity and cardiovascular diseases.

It was revealed that the frequency of obesity and overweight in relatives of the first degree of kinship of patients in the main group was 54.5%, and in the control group 20% of cases. Essential arterial hypertension was found in 55.5% of relatives of the 1st degree of kinship of group 2a and 2b, as well as 75% and 77.7% of relatives of the second degree of kinship, respectively, in group 2a and 2b, and cases of coronary heart disease and atherosclerosis also occurred with high frequency. The detection of cases of diabetes mellitus in the families of patients with abdominal obesity (AO) showed that cases of type II diabetes in relatives of the 1st degree of kinship amounted to 10% and 11.1%, respectively, in group 2a and 2b. Relatives of the II degree of kinship had a high frequency of this condition - 35% and 44.4%.

There was a predominance of diabetes mellitus on the maternal side, especially in children with AO and AH. An increase in fasting glucose was detected in 17.6%, 20% and 27.7% of children in groups 1, 2a and 2b, respectively, while an increase in postprandial glycemia was observed in 5.8%, 15%, 22.2% of children (in groups 1, 2a and 2b, respectively). When analyzing the level of triglycerides (TG), it was revealed that 29.4%, 30% and 38.8% of patients had triglyceridemia. On average, the TG level was 1.56±0.25, 1.92±0.16 and 2.3±0.23 mmol/L (in group 1, 2a and 2b, respectively).

Thus, an increase in the level of total cholesterol above the norm or its borderline values was observed in 35.2%, 35% and 44.4% of cases (in group 1, 2a and 2b, respectively), while the level of total cholesterol was significantly increased in the groups with abdominal obesity compared to the control and amounted to 4.56± 0.58; 5.01± 0.33 and 5.76±0.52 mmol/l (in group 1, 2a and 2b, respectively).

In the study of LDL cholesterol fractions, it was found that the level was 3.04 ± 0.23, 3.66± 0.18 and 4.14±0.39 mmol/l, while an increase in this indicator was observed in 29.4%, 35% and 44.4% of cases (in group 1, 2a and 2b). Analysis of uric acid concentration (MC) in children of the main group showed that it did not exceed the norm, but was significantly higher than in the control group and had a direct proportional relationship with the degree of obesity ($r=0.592$, $p<0.01$).

Studies have shown a decrease in the level of high-density lipoproteins (HDL) in patients with obesity in 17.6%, 25% and 22.2% of cases (in groups 1, 2a and 2b), its average values were 1.22±0.12; 1.13±0.09 and 1.03±0.07 mmol/l. The concentration of MC in children of the main group showed that it did not exceed the norm, but was significantly higher than in the control group, had a direct proportional relationship with the degree of obesity ($r=0.592$, $p<0.001$).

CONCLUSIONS

Thus, the relationship between BMI, indicators of lipid and carbohydrate metabolism with risk factors identified earlier, as well as an inverse correlation between birth weight and BMI, has been established. These facts characterize low birth weight as a reliable risk factor for the development of obesity and, subsequently, metabolic syndrome.

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