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#### МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ УЗБЕКИСТАН

Журнал репродуктивного здоровья и уронефрологических исследований

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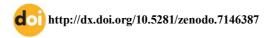
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#### SOME ASPECTS OF OBESITY IN CHILDREN

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#### ANNOTATION

Obesity is one of the urgent problems of modern clinical medicine, occupies one of the leading places among alimentary-dependent diseases and is a disease of civilization due to the conditions that are created due to the development of society. Overweight and its associated complications occur not only in adults, but also in children, and the number of cases is increasing every year. Despite the urgency of the problem of obesity, the awareness and alertness of the population on this problem remains low. Overweight in children in the general population is not considered a cause for concern, so in most cases, parents consult a doctor several years after the onset of the disease.69 children with exogenous constitutional obesity and arterial hypertension were examined. The comparison group consisted of 20 healthy children. More than 56 million children were obese and overweight in 2015, according to the World Health Organization, and obesity is now an epidemic. Arterial hypertension (AH) among children and adolescents ranges from 0.4 to 8%. A relationship has been established between body mass index, lipid and carbohydrate metabolism with risk factors identified earlier, as well as an inverse correlation between birth weight and body mass index.

Keywords: obesity, patients, body mass index, arterial hypertension.

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#### НЕКОТОРЫЕ АСПЕКТЫ ОЖИРЕНИЯ У ДЕТЕЙ

#### **АННОТАЦИЯ**

Ожирение - одно из актуальных проблем современной клинической медицины и является болезнью цивилизации в силу условий, которые создаются благодаря развитию общества. Избыточная масса тела и связанные с ней осложнения встречаются не только у взрослых, но и у детей, и число случаев увеличивается с каждым годом. Несмотря на актуальность проблемы ожирения, информированность и настороженность населения по этой проблеме остается низкой. Избыточный вес у детей в общей популяции поводом для беспокойства не считается, поэтому в большинстве случаев родители обращаются к врачу через несколько лет после начала заболевания. Было обследовано 69 детей, больных экзогенно-конституциональным ожирением и артериальной гипертензией. Группу сравнения составили 20 здоровых детей. 2015 году, по данным Всемирной организации здравоохранения, страдали ожирением и имели избыточный вес более 56 миллиона детей, а в настоящее время ожирение приобретает масштабы эпидемии. Артериальная гипертензия (АГ) среди детей и подростков колеблется от 0,4 до 8%. Установлена взаимосвязь между индексом массы тела, показателями липидного и углеводного обмена с факторами риска выявленными раннее, а также обратная корреляционная взаимосвязь между массой тела при рождении и индексом массы тела.



Ключевые слова: ожирение, больные, индекс массы тела, артериальная гипертензия.

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#### **BOLALARDA SEMIZLIKNING BA'ZI JIHATLARI**

#### **ANNOTATSIYA**

Semizlik zamonaviy klinik tibbiyotning dolzarb muammolaridan biri bo'lib, oziq-ovqatga bog'liq kasalliklar orasida yetakchi o'rinlardan birini egallaydi va jamiyat rivojlanishi tufayli yaratilgan sharoitlar tufayli sivilizatsiya kasalligidir. Ortiqcha vazn va u bilan bog'liq asoratlar nafaqat kattalarda, balki bolalarda ham uchraydi va har yili bunday holatlar soni ortib bormoqda. Semizlik muammosi dolzarbligiga qaramay, aholining bu muammodan xabardorligi va hushyorligi pastligicha qolmoqda. Bolalardagi ortiqcha vazn aholi o'rtasida tashvishga sabab bo'lmaydi, shuning uchun ko'p hollarda ota-onalar kasallikning boshlanishidan bir necha yil o'tgach, shifokor bilan maslahatlashadilar.

Ekzogen konstitutsiyaviy semizlik va arterial gipertenziya bilan kasallangan 69 nafar bemor bola tekshirildi. Taqqoslash guruhi 20 nafar sog'lom bolalardan iboat edi. Jahon Sog'liqni Saqlash tashkiloti ma'lumotlariga ko'ra, 2015 yilda 56 milliondan ortiq bola semirib ketgan va ortiqcha vaznga ega bo'lgan va hozirda esa semizlik masshtabi bo''yicha epidemiyaga aylangan. Bolalar va o'smirlar orasida arterial gipertenziya (AH) 0,4 dan 8% gacha tashkil etadi. Tana massa indeksi, lipidlar va uglevodlar almashinuvi o'rtasida ilgari aniqlangan xavf omillari bilan bog'liqlik, shuningdek, tug'ilishdagi vazn va tana massa indeksi o'rtasidagi teskari korrelyatsiya o'rnatilgan.

Kalit so'zlar: semizlik, bemorlar, tana massasi indeksi, arterial gipertenziya.

Introduction. Obesity is one of the urgent problems of modern clinical medicine [1,3,6,7,14,24,27]. Obesity occupies one of the leading places among alimentary-dependent diseases and is a disease of civilization due to the conditions that are created due to the development of society: refined nutrition with a high content of fats and carbohydrates with a high glycemic index, physical inactivity, overeating and disruption of the daily routine [4,5,9,12,18]. Excess body weight and its associated complications occur not only in adults, but also in children, and the number of cases is increasing every year. According to the latest data, in Russia every tenth child is overweight, and in the United States - every fifth. The main cause of childhood obesity, doctors call the excess intake of calories from food.

Despite the urgency of the problem of obesity, the population remains low awareness and alertness on this problem. Overweight in children in the general population is not considered a cause for concern, so in most cases, parents see a doctor several years after the onset of the disease. In this case, most often the reason for going to the doctor is not an excess of body weight as such, but the appearance in a child of such complaints as headache, dizziness, thirst, pain in the legs, discomfort in the heart area, the appearance of stretch marks on the skin, violations of sexual development, which indicates a complicated course of obesity [12,19,21,25].

Less common causes that contribute to overweight in children are: lack of physical activity; heredity; metabolic disorders; endocrine pathology (hypothyroidism, excess adrenal hormones); improper daily routine, lack of sleep; taking certain medications for a long time (hormonal drugs, antidepressants); genetic abnormalities.69 children with exogenous constitutional obesity and arterial hypertension were examined. The comparison group consisted of 20 healthy children. More than 56 million children were obese and overweight in 2015, according to the World Health Organization, and obesity is now an epidemic. [1,3,6,10,15,17,22]. 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 8%. The combination of obesity and hyperuricemia are factors in the progression of hypertension [2,4,8,11,13,16,20]. It is believed that malnutrition and intrauterine hypoxia cause neuroendocrine disorders in the fetus, involving the hypothalamic-pituitary-adrenal axis, which can serve as a mediator of this effect [5,7,9,12,14,23,26].

Purpose of the study. To identify the main risk factors for the development of obesity in children.

Materials and research methods. 69 children with exogenous constitutional obesity and arterial hypertension were examined. The main symptom of childhood obesity is an increase in the amount of

subcutaneous fat. Its distribution, as well as secondary signs, depend on the form of pathology. The alimentary type of obesity in children is usually manifested by excess fat in the abdomen, thighs, buttocks, back, chest, face and arms. Pathology is accompanied by a decrease in sensitivity to physical activity, the appearance of shortness of breath even with little activity, and an increase in blood pressure. If left untreated, excess weight causes children to develop insulin resistance, metabolic syndrome and arterial hypertension. Patients were selected based on body mass index (BMI) and waist circumference in obese children above the 97th percentile. In 32 girls (46.4%) and 37 boys (53.6%), the average age was  $14.35\pm0.21$  years (from 10 to 18 years). Waist circumference 99.82 ± 1.3 cm; waist to hip ratio (WT/OB) 0.92±0.009. 27 of them had normal blood pressure (group IIA) and 21 children had a confirmed diagnosis of arterial hypertension (group IIB). Differences in the WC/OB ratio in groups I and II were significant (p<0.05). The comparison group consisted of 20 non-obese children aged  $14.31 \pm 0.63$  years with WC  $64 \pm 1.51$  cm, WC/OJ  $0.81 \pm 0.02$  cm, while the difference in the OT/OJ ratio was significant with Group I (P<0.01). and group II (P<0.001).

Total cholesterol and high-density lipoproteins (HDL) in blood serum was determined by the enzymatic method using the Novohol-A reagent kit from 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 Triglycerides-Novo reagent kit. Statistical processing of the obtained results was carried out using the Statistica 7.0 software package (StatSoft USA).

Results of the study and their discussion. In the examined patients, the BMI value exceeded the 97th percentile and averaged  $31.27 \pm 0.51$  kg/m2, with a range of values from 23.5 to 47.2 kg/m2. BMI in group I patients reached  $28.85\pm0.52$  kg/m2; in group II, it was significantly higher than  $35.37\pm0.63$  kg/m2 (P<0.01). A significant increase in WC was noted with an increase in the degree of obesity (p = 0.01).

The mean BMI in the comparison group was 19.44±0.47 kg/m2 (P<0.001). Thus, in the total sample of children with exogenous constitutional obesity, 18 children were diagnosed with arterial hypertension, who formed group 2b. At the same time, systolic blood pressure (SBP) in children of this group was 138.7±7.2 mm. rt. Art. and diastolic blood pressure (DBP) 94.5±6.5 mm Hg. Art. (P<0.05). The waist to hip ratio is an indicator of abdominal obesity. When the values of OT / OB>0.85 in girls and >0.9 in boys is regarded as abdominal obesity.

It was found that one of the risk factors for the development of obesity is low birth weight, as well as excess body weight at birth of



more than 4000 g. 2.1 cm, while in the control group the average body weight of children was in the range of 10430.8±108.2 g. the age of 1

year, which characterized the body weight as overweight, compared with the control group. BMI was 16.02±0.7 kg/m 2 (table)

Table

#### Indicators of weight, height and BMI in children

Groups Weight Total, n=55 20,5±0,5* kg/m2	Height 13560±125,2* g	BMI 81,4±2,1	cm		
Group 1 n=17 19,5±0,2 kg/m2	12452±108,7 g	80,4±2,1	cm		
group 2a n=20	12960±155,1* g	80,5±2,1	cm	20,1±0,5	kg/m2*
2b group n=18	13980,3±101,5** ş	g81,1±0,9	cm	21,1±0,2	kg/m2 **
control group n=2	0 10430,8±	±108,2 g	79,1±1,3	cm	16,02±0,7 kg/m2

Note: \* Significance P < 0.05 in relation to control, \*\* P < 0.05 in relation to the group with a uniform type of obesity.

27 children were born with asphyxia, in 2 patients the condition on the Apgar scale was estimated at 4-6 points. In 17 cases, the pregnancy was premature, mothers with obesity of 1-2 degrees of severity in children - 9 cases, while obesity was most often accompanied by type 2 diabetes mellitus. In 7 mothers, impaired glucose tolerance was detected, in 26 mothers, children with obesity, a significant increase in body weight was noted during pregnancy.

27 children were exclusively breastfed up to 6 months, and 42 sick children were on mixed and artificial. In the control group, 15 (75%) children received natural feeding up to 6 months, and 5 (25%) received mixed and artificial feeding.

Heredity is one of the main non-modifiable risk factors for obesity and cardiovascular disease. 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 occurred in 55.5% of relatives of the 1st degree of kinship in groups 2a and 2b, as well as in 75% and 77.7% of relatives of the 2nd degree of kinship (in 2A and 2B groups, respectively), and cases of coronary disease also occurred with a high frequency. heart and atherosclerosis).

Cases of diabetes mellitus in families of patients with abdominal obesity were identified, so cases of type II diabetes in relatives of the 1st degree of kinship were 10% and 11.1% in groups 2A and 2B, respectively. Relatives of the II degree of kinship had a higher incidence of this condition in 35% and 44.4% of patients. There was a predominance of maternal diabetes mellitus, especially in children with abdominal obesity and arterial hypertension.

The debut of the disease in boys was on average  $8.9\pm0.5$  years, in girls aged  $7.7\pm0.3$  years. When assessing physical development, tall stature was detected in 17 (47.0%) children with a uniform type of obesity. Changes in the skin in the form of striae from pale pink to burgundy in 29.4% of children with a uniform type of obesity, black acanthosis in 11.7% of children in this group.

According to the analysis of carbohydrate metabolism indicators, it was revealed that the average levels of glycemia (glucose on an empty stomach and postprandially) in the main groups did not deviate from the established norm (p<0.05), which indicated the presence of insulin resistance (IR). At the same time, the concentrations of fasting glycemia and postprandial glycemia (p<0.05) were significantly higher than those in the control group and increased as obesity progressed.

An increase in fasting glucose was detected in 17.6%, 20% and 27.7% of children in groups 1, 2A and 2B, respectively, while in 5.8%, 15%, 22.2% of children (in 1, 2A and 2B group, respectively) there was an increase in postprandial glycemia.

When analyzing the level of triglycerides, it was found that 29.4%, 30% and 38.8% of patients had triglyceridemia. The average TG level was 1.56±0.25, 1.92±0.16 and 2.3±0.23 mmol/l (in groups 1, 2A and 2B, respectively). Thus, an increase in the level of total cholesterol

above the norm or its borderline values were observed in 35.2%, 35% and 44.4% of cases (in groups 1, 2A and 2B, respectively), while the level of total cholesterol was significantly higher in groups with abdominal obesity compared with the control group  $4.56\pm0.58$ ;  $5.01\pm0.33$  and  $5.76\pm0.52$  mmol/1 (in groups 1, 2A and 2B, respectively).

In the study of cholesterol fractions: low-density lipoproteins (LDL) amounted to 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 groups 1, 2A and 2B, respectively).

An analysis of the concentration of uric acid (UA) in the 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<0.001) and the level of blood pressure (BP) (r=0.446; and r=0.369; p<0.001). In children with uniform obesity, there was an increase in UA to  $0.324\pm0.011$  mmol/l, compared with the control group  $0.180\pm0.013$  mmol/l (P<0.01).

Studies of high-density lipoprotein (HDL) showed a decrease in the level in patients with obesity in 17.6% 25% and 22.2% of cases (in groups 1, 2A and 2B, respectively), its average values averaged 1.22  $\pm$  0, 12, 1.13 $\pm$ 0.09 and 1.03 $\pm$ 0.07 mmol/l.

Thus, the analysis of the concentration of uric acid 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<0.001) and blood pressure (r = 0.446; and r=0.369; p<0.001).

CONCLUSION: Thus, risk factors for the development of obesity have been identified, a relationship has been established between body mass index, lipid and carbohydrate metabolism with previously identified risk factors, as well as an inverse relationship between birth weight and body mass index, which characterizes low birth weight as a significant factor. risk of developing obesity in children. To identify obesity and assess its degree, it is enough to measure the height and weight of the child, and then calculate the body mass index. Additional examinations allow you to identify possible causes of the condition, determine the tactics of treatment.

The main principle of obesity diet therapy is to reduce the energy value of food and achieve a negative energy balance.

The most optimal approach to therapeutic nutrition for children and adolescents with obesity is the use of a classic hypocaloric diet, as the most balanced for all nutrients. Diet therapy should be prolonged, at least 6-12 months, since weight loss must be ensured over a long period of time. But at the same time, diet therapy should not disrupt the physical and mental development of the child and interfere with normal physical activity.

Doctors of all specialties should actively participate in teaching children and their families the principles of a healthy lifestyle and in the fight against physical inactivity. For obese and overweight adolescents,



regular, moderate-intensity physical activity is recommended to improve health and reduce the risk of obesity.

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