

**FEATURES OF PARACLINICAL CHANGES IN OBESITY IN ADOLESCENTS**

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**ANNOTATION**

The article describes a study of adolescents in order to determine the specifics of neurological and paraclinical changes in adolescent obesity, which has become an epidemic and an urgent problem around the world. In the early diagnosis of neurological changes in obese adolescents, the results of paraclinical examinations, electroencephalography and Doppler ultrasound are widely covered, and these examinations are among the paraclinical examinations that must be carried out for early diagnosis of complications.

**Key words:** *adolescents, obesity, neurological changes, paraclinical examinations, EEG, UTDG.*

Obesity has become an urgent problem today and is a social threat to human life. Development advances have resulted in high-calorie foods, decreased physical activity, and increased obesity (4). In almost all countries, almost 10% of the health budget is spent on treating obesity and related diseases. Obesity is not only a problem of modern society, but also a medical, social and economic problem: according to statistics, the mortality rate among overweight people is 12 times higher than the norm [6]. There is a constant trend towards deterioration in the health of schoolchildren (12). Today, the study of the factors leading to changes in the neurological and mental status in children and adolescents is one of the most pressing problems (16). It should be noted that in recent years, neuropsychological disorders of the nervous system account for 30 to 56% of schoolchildren, which is associated with limited adaptive and compensatory capabilities of the child's body (12). Obesity is one of these factors. Obesity is on the rise in almost all regions of the world, doubling every three decades. In developed countries, 25% of adolescents are overweight and 15% are obese [9]. Among adolescents, this figure is 25% of overweight and 15% of obesity (14). According to the National Health and Nutrition Examination Survey (NHANES) in 2009-2012, 33.0% of children in the United States were overweight, 35.7% were obese, and 12-19 years old were boys. 20% of children and 18.9% of girls are obese [14]. In Europe, 20% of children and adolescents are overweight, and one third of them are obese. Obesity in children and adolescents in Uzbekistan is 1.5-2 times higher than in adults, by 50-66%, and a 30% increase in this indicator over the observation period in 2012-2014 confirms the urgency of this problem in our country. During the study period, the prevalence of childhood obesity in the country was 1.5-2 times higher than among the adult population, in 2012 - 50.5, in 2013 - 59.4 2014 and in 2014 - 65.7 and, and for 3 years this figure was 30%. (8,9). Today, the timely study of the structural and functional properties of blood vessels in obesity is of great interest and is important for the early prevention and treatment of the disease (1). Identification of changes in the endothelium in the early stages of the disease, timely diagnosis and treatment of relapses is of great importance.

**Goal:** to study the features of paraclinical changes observed in obesity in adolescents.

**Materials and research methods.** The study analyzed the results of neurological and paraclinical courses for adolescents from 11 to 17 years old at school No. 1 in Samarkand. The main group consisted of 42 overweight students, and the control group consisted of 16 normal weight swimmers. The main group consisted of 20 boys and 22 girls, the control group consisted of 10 girls and 6 boys. In all adolescents, naturally, with the permission of school teachers and parents, the results of electroencephalography, examinations of UTDG from song, anthropometric, anamnestic, standard clinical and neurological curricula and paraclinical examinations were studied. Anthropometric measurements were carried out according to standard methods. Length in meters,

body weight in kilograms (accuracy in grams) is measured on an electronic scale, waist circumference is measured at navel level and leg circumference is measured at epicondyle level, estimated as a percentage, body mass index (Kettle) = body weight (kg) / Body length (m) Calculated with  $^2$ . Comparison was based on standard indicators from the World Health Organization (WHO) (SDS) program. A biochemical blood test was carried out according to laboratory parameters. ... Twelve children from the main and control groups were taken and sent to the 1st Clinic of SamDTI for electroencephalographic (EEG) and Doppler ultrasound examination (UTDG) (under the guidance of teachers and parents). Using UTDG, the mobility of the endothelium of the vessels of the brachial artery was investigated and the results of the reactivity test of the hyperemia of the brachial artery were evaluated. An increase in the initial diameter of the brachial artery by 10% or more was considered a normal change.

Research results. According to the results of anthropometric examination, adolescents of the main group were diagnosed with obesity I (45%), II degree (39%) and III degree (16%). When studying the anamnestic data of adolescents in the main group, overweight was detected in 39% of both parents, 46% only for the mother and 31% only for the father. In the control group, this indicator was 9% for both parents, 12% for one mother and 21% for one father. The number of children with low birth weight was 41% and 20% in the study and control groups, and 39% and 14% were born in the underweight group. In the control group, natural, artificial and mixed nutrition was found in 29%, 26% and 45% of adolescents, and in the control group - in 52%, 31% and 17% of cases, respectively. Romberg's test revealed instability (17%), finger tremor (9%) and diffuse muscular hypotension (20%), 70% of sympathetic abnormalities (mainly in girls) and 5% of parasympathetic effects from autonomic changes.

Paraclinical examination revealed the following EEG changes in adolescents: mean changes in the cerebral cortex 49% in the main group and 7% in the control group, diffuse diffuse changes in the bioelectrical activity of the cerebral cortex 21% in the main group and 2.4% in the control group. 33.3% in the control group and 6% in the control group and 35% in the control group and 8% in the control group with a low-amplitude basal alpha rhythm. In the main group, endothelial dysfunction (70.7%) was observed with UTDG, while normal endothelial changes (29.3%) were found in adolescents. In the control group, this indicator was (13.3%) and (86.7%).

Results. In adolescents, metabolic syndrome is manifested by specific paraclinical changes, such as diffuse diffuse changes in the bioelectrical activity of the cerebral cortex, damage to the midline structures and the expression of a low-amplitude basal alpha rhythm, as well as endothelial dysfunction in obese children by almost 4 times. not only early diagnosis and treatment, but also the prevention of the development of its complications are important in the timely implementation of measures.

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