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**PHYSICAL DEVELOPMENT AND ADAPTATION OPPORTUNITIES OF CARDIOVASCULAR SYSTEM TO PHYSICAL ACTIVITY OF TEENAGERS**

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It is known that diseases of heart and vessels of adults originate in childhood. Disorders of adaptation of cardiovascular system (CVS) to physical activity indicate prepathological states and pathological changes of heart, early diagnostic of which is important in childhood.

**Purpose:** to detect risk factors of formation of cardiac pathology and adaptation possibilities of CVS to physical activity of teenagers by studying anthropomorphic measurements, main parameters of vital functions, analysis of results of Ruffier’s test.

**Object and methods.** 94 teenagers, pupils of 9th forms (43 boys and 51 girls) 14-15 years, 42 of which live in city (Ordzhonikidzevskiy district, Kharkiv) and 52 of which live in Kharkiv region have been examined. Studying of anthropomorphic measurements and parameters, such as body mass (M, kg), standing height (H, m), body mass index (BMI), body surface area (BSA, sq. m), chest circumference(ChC, cm), waist circumference (WC, cm), hip circumference (HC, cm), mid-arm circumference (MAC, cm), thigh circumference (ThC, cm), shin circumference (ShC, cm), skinfold thickness under scapula (STS, mm), skinfold thickness over biceps (STB, mm), skinfold thickness over triceps (STT, mm), skinfold thickness in ileocecal region(STI, mm) with following calculation of total skinfold thickness (TST, mm). Percentage of fat in organism (% of fat) has been assessed for studying of body structure. Vital functions, such as respiratory rate (RR), heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP) have been studied. Ruffier’s test have been held for studying of functional state and adaptation opportunities of CVS to physical activity.

**Research results.** It has been established, that anthropomorphic measurements and parameters of girls and boys that live in districts of region don’t have significant changes from normalized ones (all р>0.05). However, they have significant sexual differences: girls have significantly smaller parameters, such as M, H, BSA, WC, WC/HC, than boys, and they have significantly larger STB, STT, STS, STI, TST, % of fat (all р<0.05). Obtained results reflect normal physiological sexual differences of physical development of children, which become significant in pubescence. Changes between boy and girls of the city have tendency to decrease. Boys have statistically significant larger value of STB than girls (р<0.05), but there are no sexual differences in parameters, such as STT, STS, STI, TST, % of fat (all р>0.05). Boys, that live in village have significant larger H (р<0.05) and ShC (р<0.05). While there is no difference in M (р>0,05), boys from village have significantly smaller values of STB, STT, TST, % of fat (all р<0.05). Specific gravity of muscular component of body mass of boys from the city respectively decreases, and specific gravity of fat component increases. It has been confirmed by the fact that values of TST (р<0.05), % of fat (р<0.05) of boys from the city are significantly larger than normalized parameters. While comparison it has been detected that parameters of vital functions of girls doesn’t vary with inhabitancy. (all р>0.05). Boys that live in the city have increased parameters of SBP (р<0.05) and DBP (р<0.05), comparatively with both appropriate parameters of male teenagers from village and normalized ones. Boys that live in the city have below the average or low level of adaptation of CVS to physical activity more often than girls and boys of the same age from village. There is a correlation between results of Ruffier’s test and % of fat (r=+0.65, р<0.05) and body mass index (r=+0.53, р<0.05) that confirms the influence of overweight on worsening of functional state of CVS.

Thereby, teenagers with overweight, increased blood pressure and/or decreased level of adaptation of CVS to physical activity form a risk group of formation of cardiac pathology and that’s why they should be under supervision.