

Original Article

Functional state of cardiovascular system of 10–16-year old teenagers under the influence of cheerleading classes

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Abstract:

Purpose: to determine extent of influence of cheerleading classes on functioning of cardiovascular system of girls of 10-16 years old. **Material:** Researches were conducted on the basis of educational institutions of Kharkov. 640 girls of 10-16 years old took part in them, of whom 7 main and 7 control groups were made. **Results:** functional state of cardiovascular system of girls of 10-16 years old is investigated; differences in age aspect of indicators of systolic and diastolic arterial blood pressure, heart rate in rest and after the dosed physical activity are considered; positive influence of exercises of cheerleading on functioning of cardiovascular system is revealed. **Conclusions:** 1) "Average" level of regulation of cardiovascular system of girls of 10-16 years old is established as a result of the initial research. 2) Application of exercises of cheerleading in the course of physical education positively influenced functioning of cardiovascular system of the studied contingent.

Key words: physical education, schoolgirls, physical development, lesson, exercise.

Introduction

Modern living conditions cause essential increase in incidence among various segments of the population. The special concern causes state of health of children and teenagers, at whom sharp deterioration in physical development and motive preparedness is noted, according to a number of scientists (Wellard & Sekker, 2017; Pomeshchikova, Iermakov et al., 2016; Mameshina, 2016; Podrigalo et al., 2016; Keyl & Harris, 2013; Kuzmenko & Shesterova, 2009) for the last decade. One of criteria of level of physical development are indicators of functioning of cardiovascular system which indicators depend on heredity, anthropometrical data, stages of puberty, extent of development of skeletal muscles, psychological climate in family and also on academic, workload and physical activities (Antropova, Paranicheva et al., 2009; Maslyak & Krivoruchko, 2016; Mameshina, 2016; Podrigalo, Iermakov et al., 2015).

A number of researches showed that intensification of educational process, wide use of various pedagogical innovations, lead to discrepancy of an academic load to functionality of an organism and decrease in adaptable mechanisms (Pavlenko, 2014; Maslyak, Mameshina & Zhuk, 2014; Vrublevskiy et al., 2014). Therefore, the search of solutions of this problem is extremely necessary.

One of conditions of increase in level of physical development and motive preparedness of pupils is modernization of physical education (Aghyppo, Tkachov & Orlenko, 2016). A number of authors dealt with an issue of optimization of process of physical education of pupils by introduction of various innovative means, methods and approaches to the organization of physical education of children and teenagers. So, Maslyak, Shesterova, Kuzmenko et al., 2016, suggest to use the special exercises, which are directed to improvement of functional state of vestibular analyzer; Pomeshchikova, Shevchenko et al., 2016 – exercises and ball games; Loshenko & Nazarenko, 2007; Stepanova, 2009 – aerobics; Artem'yeva & Nechytailo, 2014; Skurikhina, Kudryavtsev et al., 2016 – kinds of fitness; Mulyk & Grynova, 2015 – tourism; Filenko et al., 2013 – rugby-5 Loquet, 2011 – rhythmic gymnastics.

In our opinion, cheerleading is an effective remedy of physical education. It unites in itself elements of choreography, acrobatics, gymnastics, sports and national dances (Bala & Maslyak, 2014; Carrier & McKay, 2006; Chappell, 2005). A number of works is devoted to studying of efficiency of application of cheerleading. Authors investigated impact of cheerleading on the level of development of various physical qualities (Bala, 2015; Kryvoruchko, Masliak, Zhuravlyova, 2013, 2015; Lutsenko & Bodrenkova, 2013; Pyatnickaya, 2015); physical working capacity (Kryvoruchko & Masliak, 2015); physical health (Bala & Maslyak, 2011, 2012). At the same time the question of influence of means of cheerleading for state of cardiovascular system of girls of 10-16 years old is studied insufficiently.

The purpose of the research: to determine extent of influence of cheerleading classes on functioning of cardiovascular system of girls of 10-16 years old.

Material & methods

The researches were conducted on the basis of educational institutions of Kharkov. 640 girls of 10-16 years old took part in them, of whom 7 main and 7 control groups were made. All children, who participated in the research, were assigned to main and preparatory medical group. Exercises of cheerleading (basic movements, hopping elements, stunts, pyramids, etc.) were included in the educational process on physical education of girls of the main groups during the experiment.

Research methods: theoretical analysis and synthesis of data of scientific and methodical literature, pedagogical experiment, medico-biological methods, methods of mathematical statistics. Functional state of cardiovascular system was determined by indicators of regulation level of cardiovascular system (Robinson's index) and extent of reaction of cardiovascular system on standard physical activity (Ruffie index).

Indicators of arterial blood pressure at rest, heart rate at rest and after the dosed physical activity were studied (30 squats for 45 seconds).

Results

Considering the received results, the lack of reliable differences in indicators of the studying control and main groups on all studied parameters is revealed ($p > 0,05$).

The analysis of the results, reflecting state of cardiovascular system (Robinson's index) in age aspect, showed the insignificant increase in indicators of arterial blood pressure with age ($p > 0,05$). Indicators of systolic pressure of girls of 12 years old make an exception, which results are lower, than girls of 10-11 years old and also indicators of diastolic pressure of schoolgirls of 10 years old which are higher, than girls of 11-12 years old have and schoolgirls of 16 years old, which indicators authentically prevail over indicators of schoolgirls of 15 years old ($p < 0,05$) (Figure 1-2).

Considering the received results of heart rate, the lack of reliable differences in indicators ($p > 0,05$) with the general tendency to decrease in results with age is revealed generally (Figure 1-2). Indicators of girls of 10-11 years old of control group make an exception, which data are reliable above, than schoolgirls of 14 years old ($p < 0,01$) and the data of girls of 15-16 years old of main group which are authentically prevailing over data of girls of 14 years old ($p < 0,05$).

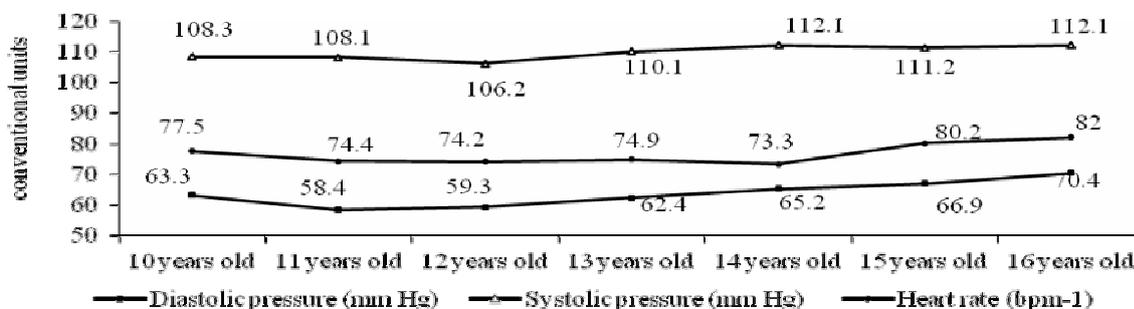


Fig. 1. Age comparisons of average values of cardiovascular system of schoolgirls of main groups of 10-16 years old before the experiment

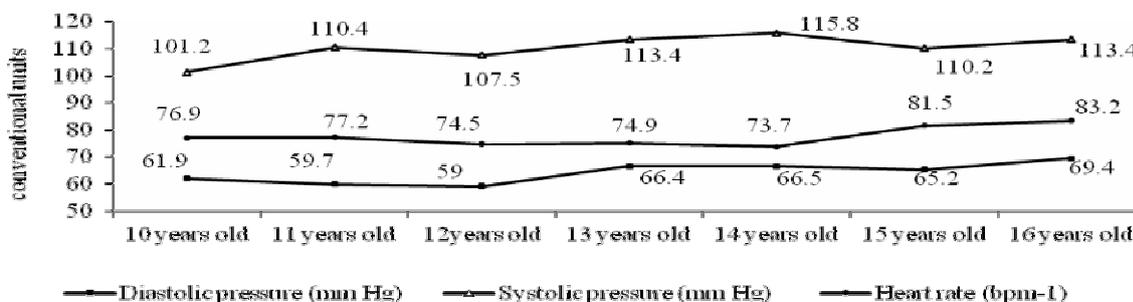


Fig. 2. Age comparisons of average values of cardiovascular system of schoolgirls of control groups of 10-16 years old before the experiment

