

CHARACTER OF SECULAR CHANGES IN FUNCTIONAL INDICATORS AMONG SCHOOLCHILDREN OF POLOTSK (REPUBLIC OF BELARUS)

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Dynamics of functional indices was followed for 8-, 13-, and 17-year-old schoolchildren of Polotsk. Data on 433 males and 450 females were collected in 2002 and 2012. There was a significant reduction of the systolic blood pressure (SBP) levels in 2012 relative to 2002: for 8-year-old males by 3.4 mm Hg ($p < 0.05$), for 13-year-olds – by 4.6 mm Hg ($p < 0.01$) and for 17-year-olds – by 8.7 mm Hg ($p < 0.001$). For females SBP decreased in all groups, but statistically significantly in 13-year-olds – by 9.8 mm Hg ($p < 0.001$) and in 17-year-olds – by 8.5 mm Hg ($p < 0.001$). Age changes of diastolic blood pressure in children were not so straightforward. Analysis of the pulse rate showed a significant secular decrease from 2002 to 2012: for 8-year-old males – 5.6 beats/min less ($p < 0.01$), for 13-year-olds – 7.2 beats/min less ($p < 0.001$), for 17-year-olds – 4.2 beats/min less ($p < 0.02$); for 8-year-old girls – 5.1 beats/min less ($p < 0.001$), for 13-year-olds – 9.9 beats/min less ($p < 0.001$), for 17-year-olds – 6.6 beats/min less ($p < 0.001$). Changes in hand dynamometry (HD) in the period from 2002 to 2012 were also investigated among Polotsk schoolchildren. A highly significant ($p < 0.001$) decline of HD among 8-year-old boys was revealed: for the right hand – 1.6 kg less, for the left hand – 1.7 kg less. For children older than 10 years mean values of HD for both hands increased. In groups of males of 13- and 17-year-old the increase was up to 0.7–1.4 kg, though the differences were not significant. Among schoolgirls of all age groups HD values did not change. The decrease of hand strength among schoolchildren was observed in various countries, so the tendency for the HD level to grow parallel to the improvement of the functional traits of the cardiovascular system among adolescent boys of Polotsk deserves attention and might be connected with stabilization of ecological and economic situation in Belarus.

Key words: *schoolchildren, performance indicators, secular trend*

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DO WE WALK ENOUGH IN MODERN TIME?

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Modern human life style has led to significant decreases of everyday physical activity and bipedal locomotion. It has previously been shown that skeletal robustness (relative elbow breadth) is associated with daily step counts. The aim of the study was to investigate whether other skeletal measures, particularly pelvic breadth, also may have changed in recent decades. Elbow breadth, pelvic breadth (bicristal), and thoracic depth and breadth, of up to 28,975 healthy females and 28,288 healthy males aged 3–18 years from cross-sectional anthropological surveys performed between 1980 and 2012 by the Universities of Potsdam and Berlin, Germany, were re-analysed. Since 1980 relative elbow breadth (Frame index) significantly decreased in both sexes (<0.001). The trend towards slighter built was even more pronounced in absolute and relative pelvic breadth. In contrast, equivalent changes of parts of the skeletal system that are not involved in bipedal locomotion such as thoracic breadth, thoracic depth and the thoracic index were absent. The present investigation confirms the decline in relative elbow breadth in recent decades. Analogous, but even more pronounced changes were detected in pelvic breadth that coincides with the modern decline in upright locomotion. The consequences to health status of the following adult generations in future are unclear. Firstly, the findings underscore the phenotypic plasticity of humans while adapting to new environmental conditions and maybe they are not pathological changes. But the influences of health status in locomotor system cannot be excluded in future. From this point of view we do not walk enough today.

Key words: *bipedal locomotion, modern life style, skeleton breadth measurements*

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