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OSSEOUS COMPONENT OF THE HUMAN BODY WEIGHT: ANTHROPOMETRIC ESTIMATE AT THE STAGES OF POSTNATAL ONTOGENESIS

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The purpose of the work was to increase the accuracy of body weight osseous component estimate while considering absolute amount of osseous tissues and ectomorphic component with the entry of regional age-sex indices.

The materials of the research were the results of the direct anthropometry, performed by means of specific program among more than 1300 individuals, stratified as for these ontogenetic period.

Our methodology is prompted by the problem, which is solved by the following: common estimation of the component analysis of human body weight includes anthropometry according to the linear and volumetric indices with a further calculation of relative content of body weight osseous component. According to the methodology, the body height (H, sm) and its weight (BW, kg) is measured and the height-weight index (IHW) is calculated, as well as the width of distal epiphysis of shoulder (s_1, sm), forearm (s_2, sm), thigh (s_3, sm), shin (s_4, sm). Having calculated its mean value according to the $\delta=(s_1+s_2+s_3+s_4)/4$ formula, the absolute mass of osseous tissues is designated (MAO, kg) according to the $MAO=\delta^2\times H\times 1{,}2/1000$ formula. Then the estimation of osseous component is made according to the ectomorphic index (MOT), which is calculated by the MOT= IBW×X1–X2 formula, considering the appropriate regional age-sex coefficients (X_1–X_2) and variability (SD) of ectomorphic index MOT±SDOT and absolute amount of osseous tissues MAO±SDAO (Pat. №78523 U, Ukraine).

For each of the examined individuals, based on the data of their direct anthropometry, the absolute mass of osseous tissues (MAO) and ectomorphic index (MOT) have been calculated similar to the example mentioned above, and by means of the accumulated database in the EXEL software environment. It assisted in the identification of the ontogenetic harmonicity of body weight osseous component; relative and absolute indices of frequency of this phenomenon have been designated. The analysis of the data shows that sex differences are characterized by the reliable ($p<0{,}01$) higher prevalence of ontogenetic disharmony of body weight osseous component among individuals of male sex in the VI and VII ontogenetic period, whereas in the preadult age, the frequency of disharmonic variants among individuals of

male and female sex is not reliably different. High frequency of disharmony of body weight osseous component among the individuals of female sex is evident in the first period of the mature age (25,0±4,0% among women and 10,5±2,9% among men, respectively, p<0,001). Generally, among 1372 individuals the frequency of disharmony of body weight osseous component varied from 8,0±2,1% (individuals of female sex in the period of the second childhood) to 25,0±4,0% (women of mature age). Among individuals of male sex the frequency of disharmonic types varied from 10,5±2,9% to 17,3±2,5%.

Conclusion. On he basis of the direct anthropometry the regularities of body weight osseous component formation were detected at the stages of postnatal ontogenesis, which became apparent by different frequency of disharmony of body weight osseous component due to osseous component, first and foremost, among individuals of female sex.

Judging by the example and the results of generic implementation of accumulated anthropometric data, the development of traditional methodology of anthropometry, and the substantiated innovative methodology, in particular, it is possible to ensure determination of ontogenetically disharmonic body build as for the body weight osseous component, taking into account the ontogenetic features.

Estimation of the ontogenetic disharmony of body weight osseous component is related to anatomy, topographic anatomy, multiple clinical disciplines and may be used while considering the ontogenetic features of the body build in estimation of component analysis of its weight.

The findings explain the age-sex differences in the frequency of dysfunctions formation, prenosological and nosologically explained pathological state as manifestations of general process of growth and development in postnatal ontogenesis.