ISSN: 2573-9506

Research article

International Journal of Women's Health Care

Women's Volleyball: Study Series Features Anthropometric Values and Morphological Indicators in Somatotypes Volleyball Players Athletes

Konstantin Anatolyevich Bugaevsky*

Department of Medical and Biological Foundations of Sports and Physical Rehabilitation, The Petro Mohyla Black Sea State University, Ukraine

***Corresponding Author**
Konstantin Anatolyevich Bugaevsky, Assistant Professor, Department of Medical and Biological Foundations of Sports and Physical Rehabilitation, The Petro Mohyla Black Sea State University, Ukraine.

Submitted: 2024, Mar 25; **Accepted**: 2024, Apr 15: **Published**: 2024, Apr 25

Citation: Bugaevsky, K. A. (2024). Women's Volleyball: Study Series Features Anthropometric Values and Morphological Indicators in Somatotypes Volleyball Players Athletes. *Int J Women's Health Care, 9*(1), 01-03.

Abstract

The article presents data from a study on the structural features and options for individual violations of the bone of the pelvis, a number of anthropometric indices and morphological index values in-volleyball girls. The above analysis of the data, presented the findings.

Keywords: Bony Pelvis, Volleyball, Somatotypes, Pelviometriya, Anthropometry, Morphological Indices, Female Athletes

Abbreviation

BMI: Body Mass Index
SH: Shoulder Width
PW: Pelvic Width
SDI: Sexual Dimorphism Index
PBI: Pelvic Bone Index
RSWI: Relative Shoulder Width Index
RPWI: Relative Pelvic Width Index

1. Introduction

In recent decades, the interest of researchers in the issue of women's sports and its impact on the body of athletes has increased significantly. Scientists note significant metabolic disorders in the body of female athletes; serious disorders occur in the skeletal system. So, in particular, the time of "maturation" and formation of bones changes, incl. and pelvic, the timing of the closure of zones (nuclei) of ossification in the epiphyses of tubular bones, which are responsible for the length of the human body, is disrupted [1]. Serious violations occur in the formation of the constitution of female athletes and in the formation of their sexual somatotypes [2]. We believe that the peculiarities of knowledge of sexual somatotypes, anthropometric and morphological features of the structure of the bony pelvis of female volleyball players can help improve not only the level of their sports skills, but also maintain their somatic and reproductive health. This determined the relevance of our research, both from the search for new data on the characteristics of human adaptation and life activity, and from the point of view of practical healthcare in the issue of prevention of reproductive and obstetric pathologies.

1.1. Aim of Study

The purpose of this study and the subsequent article, based on the results of the study, is to identify and analyze the obtained research data on a number of anthropometric indicators and morphological values among female volleyball players.

2. Material and Methods

The study used classical methods for determining anthropological indicators and morphological index values, and the method of mathematical statistics. The obtained data were statistically processed using Student's t-test, corresponding to the degree of accuracy $p<0.05$ and analyzed. The method of literary critical analysis and available sources of information on the issue under study was also used. The index method was also used, using in the study the determination of a number of morpho functional index values necessary for it.

2.1. Organization of the Study

11 female athletes (n=11) of adolescence and first reproductive age took part in the study to determine the structural features and individual changes of the bone pelvis and a number of anthropometric indicators and morphological values in female volleyball players. The study was conducted on the basis of the training complex of Zaporozhye National University (ZNU). Of

the number of athletes who took part in the study, the level of sports qualifications was presented as follows: master of sports (MS) - 1, candidate master of sports (CMS) - 6, I sports category - 4 athletes. The experience in volleyball ranged from 7 to 11 years. The age for starting sports in a group is from 4 years to 7-10 years.

3. Results and Discussion

The average age of the athletes in the group (n=11) was 20.85±2.03 years. When conducting an anthropometric study, the following results were obtained: the average values of body weight and length were, respectively: 65.27±2.02 kg and 178.91±2.03 cm ($p<0.05$). At the same time, the minimum body weight was 54 kg, the maximum 75 kg, body length: minimum - 172 cm (above average height), maximum - 185 cm (very tall height) [3,4]. In accordance with the existing classification of body length, the value of this indicator in the group corresponds to high growth (for women - from 174 to 179 cm). Weight-height ratios were determined by calculating body mass index (BMI). The average BMI in the entire group was 20.09±0.47 kg/cm², which corresponds to normal values [5]. When dividing female volleyball players into somatotypes, according to the characteristics of sexual dimorphism (J. Tanner's classification), we determined such anthropometric indicators as shoulder width (ShH) and pelvic width (PW). The width of the shoulders is considered to be the biacromial size, and the width of the pelvis is the bicristal size [6].

In the study group, the width of the shoulders was 35.63±0.34 cm, and the width of the pelvis was 27.68±0.44 cm. Taking these data into account, we obtained the following indicators: the average value of the sexual dimorphism index (SDI) in the group was 80 .34±1.80 ($p<0.05$). This corresponds to the values of the mesomorphic somatotype (73.1–82.1) [2.7]. But, upon closer examination of the obtained SDI values in the group, only 1 girl volleyball player meets the criteria for the gynecomorphic (female) somatotype, which is 9.09%. Three female athletes, or 27.27%, correspond to the parameters of the andromorphic (male) sexual somatotype (indicator more than 82.1) [2,7]. with IDI values: 82.5; 84.5; 92.5. The remaining 7 (63.64%) girls are classified as mesomorphic sexual somatotype. The data obtained are alarming, since according to L.A. Lopatina and a number of other researchers, the presence of a mesomorphic sexual somatotype "indicates mild gender dysplasia, and the andromorphic type in women is regarded as an inversion of sexual dimorphism" [2,7]. In this regard, attention is drawn to the fact that all 11 athletes have shoulder widths significantly greater than the width of their pelvis. These indicators in the group are, respectively, 35.36±0.34 cm and 27.68±0.44 cm. This ratio, when the width of the shoulders is greater than the width of the pelvis, is characteristic of a masculine, not a feminine body type.

Determining the values of the relative shoulder width index (RSWI) indicates the degree of proportionality of the ratio of the following dimensions: shoulder diameter and body length. The relative shoulder width index (RSWI) in the entire group was 19.77 ± 0.21 cm ($p<0.05$), which corresponds to the mesomorphic type [6,8]. But upon closer examination, it was determined that in the 1st (9.09%) student the IOSP indicators correspond to the dolichomorphic type (>19.1), the mesomorphic type (19.1-21.7) was determined in 10 (90.91 %) female athletes. The brachymorphic type (<21.7) was absent among the studied volleyball players. The relative pelvic width index (RPI), or morphia index (A.I. Kozlov, B.A. Nikityuk, 2007) in the entire group was 15.48 ± 0.23 cm ($p<0.05$), which corresponds to stenopyelia or narrow pelvis (value up to 15.9 cm) [6,8]. Signs of metriopyelia (middle pelvis - 16.0-17.9 cm) in the group corresponded to 2 (18.18%) athletes [3,6]. Of great importance for determining the degree of maturity and formation of the pelvic bones is the determination of the values of a new morphological indicator - the pelvic bone index (PBI), proposed by N.I. Kovtyuk (2003). In order to identify deviations in the formation of the pelvic bones, the values of PBI were determined as an integral indicator of the formation of the pelvic bones in female volleyball players of adolescence and first reproductive age. As a result of our study, the average PBI value for the entire group was 38.92±1.51 cm ($p<0.05$), which corresponds to the norm (from 30 to 50) [9].

4. Conclusion

The results revealed as a result of the study indicate not only shifts towards mesomorphy and andromorphy in female athletes, but also hormone-dependent changes in the skeletal system. Disorders of the bony pelvis, against the background of broad shoulders and changes in a number of important morphological indices towards andromorphy, indicate a restructuring of their body, with the formation of a male sexual somatotype.

References

1. Silaeva LV., Bulykina LV., Belova NYu Age-related characteristics of physical development and physical training of young female volleyball players. Methodological manual. –2013. Issue 17. 132 p.
2. Tkachuk, M. G., & Dyusenova, A. A. (2015). Sexual dimorphism and its reflection in sports: monograph. *M. Berlin: Direct-Media.*
3. Syrova OV., Zagorovskaya TM., Andreeva AV. The relationship between anthropometric parameters and pelvic dimensions in girls aged 17-19 years // Morphology. 2008. Vol. 133. 3;45–47.
4. Tyan OV., Stklyanina LV., Savenko LD. Anthropometric characteristics of patients with various forms of pelvic pain // Ukrainian morphological almanac. 2012. Volume 10. 3:132–133.
5. Nikitjuk, D. B., Nikolenko, V. N., & Klochkova, S. V. (2015). Minnibaev TSh. Body mass index and other anthropometric indicators of physical status, taking into account the age and individual typological features of the constitution of women. *Voprosy pitanija, 4*, 47-54.
6. Strelkovich, T. N., Medvedeva, N. N., & Khapilina, E. A. (2012). Anthropometric characteristics of the pelvis of women depending on the somatotype. *the world of scientific discoveries*, *2*, 60-73.

7. Lopatina, L. A., Serezhenko, N. P., & Anokhina, J. A. (2013). Antropometricheskaya kharakteristika devushek po klassifikatsii Dzh. *Tannera [Anthropometric characteristics of girls according to the classification of John. Tanner]. Fundamental'nye issledovaniya-Fundamental research, (12-3), 504-508.*
8. Yashvorskaya, V. A., & Levitsky, M. I. (2012). O nekotorykh antropometricheskikh osobennostyakh taza u sovremennykh devushek [Some anthropometric features of the pelvis in modern girls]. *Akusherstvo i ginekologiya-Obstetrics and Gynecology,* (1), 56-59.
9. Kovtyuk, N. I. (2004). Dinamika formuvannya rozmiriv taza u divchat shkil'nogo viku Chernivets' koï oblasti [The dynamics of the formation of the size of the pelvis in girls of school age Chernivtsi region]. *Klinichna anatomiya ta operativna khirurgiya-Clinical anatomy and operative surgery*, (3), 48-49.