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Research Article

Analysis of Identified Variants of Sexual Somatotypes in Young Female Judo Athletes

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Received date: November 27, 2024; **Accepted date:** December 12, 2024; **Published date:** January 04, 2025

Citation: Konstantin A. Bugaevsky, (2025), Analysis of Identified Variants of Sexual Somatotypes in Young Female Judo Athletes, *J New Medical Innovations and Research*, 6(1); **DOI:**10.31579/2767-7370/132

Abstract:

The article presents the results of the conducted study, which aims to study and analyze the variants of the identified sexual somatotypes in female students of the 1st to 5th years of the University of Physical Education, professionally engaged in judo.

Aim of the article

The purpose of this article is to present and analyze the results of a study devoted to the study of the variability of sexual somatotypes in female students of different years of university involved in judo.

Hypothesis of the article

During the preparation for this study, the author proposed the following working hypothesis, the essence of which was as follows: as female athletes involved in judo at the Institute of Physical Culture age, as the duration of their training in this sport increases, the duration of their training and competition regimes, physical and psycho-emotional loads constantly increase, an active adaptive-compensatory restructuring of their bodies and organism as a whole occurs, which leads to a change in their original, characteristic for women, gynecomorphic sexual somatotype, towards a transitional, mesomorphic sexual somatotype and, in some cases, to a pathological type, for women, andromorphic, inverse sexual somatotype. All this leads to serious changes in such types of systems of the female athletes body as: cardiovascular, musculoskeletal, endocrine and reproductive systems, female athletes.

Method and materials of the study

In conducting this study, the following research methods were used: the method of literary-critical analysis of available sources on the issue studied by the author; the method of anthropometry, with the definition of the biacromial size (shoulder width) and the intercrestal size of the bony pelvis (d. cristarum), or the width of the pelvis in female athletes, in SMA also the method of determining the morpho-functional index values; the method of mathematical statistics. The obtained dimensions were used to determine the value of the sexual dimorphism index (SDI), calculated according to the method of J. Tanner (1996), with the subsequent determination of the values of sexual somatotypes in each of the groups of athletes we studied [1-4]. All young athletes participating in the study conducted by the author gave their voluntary, both oral and written consent to participate in it.

The study involved female students of the University of Physical Education and Sports, 1st-5th years, professionally involved in judo: 1st year - 19 athletes; 2nd year - 17 athletes; 3rd year - 18 athletes; 4th year - 16 athletes; 5th year - 17 athletes. A total of 87 young athletes, of adolescence (18.74±1.03 years) and the first reproductive (mature) age - 22.26±1.34 years. Sports experience - from 3.5 to 10 years. The level of sports qualification - from II-I category, and up to a candidate for master of sports and master of sports. The frequency of training - from 4-5 to 5-7 times a week, for 1.5-2.5 - 3 hours. All athletes who took part in the study expressed their voluntary participation.

Keywords: female students; university of physical education; judo; sexual somatotypes

Introduction

Professional training in any kind of modern sport, with its intensive physical and psychological loads on the body of sportswomen of different age groups, during the training and competition period, has a direct impact on the changes occurring in their body. These adaptive processes directly affect all organs and systems of the body of sportswomen. In order to achieve success and victories in any kind of sport, you need to be stronger, faster, more resilient than your competitors, be able to quickly rebuild and adapt to difficult conditions and increased requirements of each of the

sports disciplines. The musculoskeletal, cardiovascular and respiratory systems, endocrine and reproductive systems, like all the others, must work in an increased, but economically rational mode, which ultimately leads to victory [1-4]. Many researchers of recent years have reliably noted that the winners are primarily "masculine sportswomen", in whose bodies adaptive processes lead to a somatic (bodily) restructuring of the sportswoman to the energy supply and functioning mode of the "male type". In other words, sportswomen undergo a process of masculinization and androgenization, with active hormonal restructuring, one of the key moments of which is a change in the hormonal supply of the sportswomen's body - hyperandrogenism (an increase in male sex steroids and, accordingly, compensatory hypoestrogenism, with a decrease in the production of their own estrogens and their effect on the sportswoman's body [1-4]. Such a type of martial arts as judo, which attracts an increasing number of sportswomen of different age groups, is no exception.

There is the following regularity, confirmed by both domestic and foreign researchers of this problem - the more time, volume and level of sports qualification of the athlete, the greater the probability of shifting her sexual somatotype from physiological gynecomorphic, to intermediate (transitional) - mesomorphic and, in fact, to pathological for women, inverse - andromorphic sexual somatotype [1-4]. This entire long path of adaptation to constantly increasing physical activity is accompanied by forced adaptive changes in all organs and systems of the athlete's body. At the same time, hyperandrogenism and masculinization of the body become inevitable phenomena, and the reproductive system of female athletes falls into an adaptive "sleep" mode of a forced "waiting" state, until the situation changes. In an athlete, due to hyperandrogenism, strength, speed, endurance, physical performance increase, which brings its fruits in the form of increased athletic achievements and victories in competitions. Most athletes and their coaches are quite satisfied, especially during the peak of active sports activities and demand for the athlete. But what next, when sports are left in the past and no longer relevant?! Unfortunately, there are virtually no global studies talking about the long-term consequences of such adaptive changes in the body of female athletes. There are many research papers that reveal the negative aspects of the "triad" of athletes, there are a number of works on late pathology of the cardiovascular (ischemic heart disease) and skeletal systems (osteoporosis), pathological course of menopause and other problems associated with the reproductive and endocrine systems in older and elderly athletes. [1-4]. In this regard, a thorough study of the dynamics of changes in sexual somatotypes in athletes of different age groups, in different sports, is very relevant and in demand.

Results of the study and discussion

After conducting the anthropometric measurements of the shoulder and pelvic width, in cm, required for the study, the results were obtained, reflected in Table 1, at $p>0.05$.

Name of the indicator	Shoulder width, cm	Pelvis width, cm
1st year female students (n=19)	34,12±1,41	27,14±0,53
2st year female students (n=17)	35,39±1,23	27,38±0,55
3st year female students (n=18)	36,69±1,36	27,78±0,68
4st year female students (n=16)	38,44±1,43	28,29±0,36
5st year female students (n=17)	39,28±1,47	27,79±0,88

Table 1: Anthropometric indicators in the studied groups of female judo students

The analysis of the obtained anthropometric results showed that with age (from junior to senior years), as they grow older and mature, the transverse dimensions of the width of the shoulders and pelvis increase. But, at the same time, in all groups of female athletes, the shoulder width indicators exceed the pelvis width indicators, which corresponds to a masculine, not feminine, body type in female athletes. Also, the average pelvis width values do not quite correspond to the normative for this age group, at 28-29 cm. Only in female students, starting from the 3rd to the 5th year, inclusive, this indicator approaches the average normative values, which indicates (indirectly) the phenomena of androgen and estrogen imbalance, such as hyperandrogenism/hypoestrogenism. Sportswomen, especially seniors, with large volumes of physical activity, long sports experience and a higher level of sports qualifications, have a clearly masculine (trapezoid) body type - with broad shoulders and narrow pelvis [1-4]. After carrying out the necessary mathematical recalculations, in order to determine the indicators of the sexual dimorphism index (SDI), according to the method of J. Tanner (1996), its values were obtained, presented in Table 2:

Name of the indicator	Gynecomorphic sexual somatotype	Mesomorphic sexual somatotype	Andromorphic sexual somatotype
1st year female students (n=19)	11 (57,89%)	8 (42,11%)	нет
2st year female students (n=17)	7 (41,18%)	10 (58,82%)	нет
3st year female students (n=18)	4 (22,22%)	12 (66,67%)	2 (11,11%)
4st year female students (n=16)	No	12 (75,00%)	4 (25,00%)
5st year female students (n=17)	No	11 (64,71%)	6 (35,29%)

Table 2: Values of the SDI in the studied groups of female judo students

The analysis of the obtained results convincingly showed that in female students from the first to the fifth year, as they mature, increase their sports experience, grow their sports qualifications and undergo many years of intensive physical activity, changes occur in the adaptive formation of their sexual somatotypes. Thus, if in first-year students, with the least sports experience, level of sports qualifications and still insignificant physical activity, the physiological sexual somatotype dominates over the number of mesomorphic athletes, with a complete absence of representatives with andromorphy, then gradually, the picture begins to change. In second- and third-year students, although an

insignificant number of gynecomorphic athletes remains, their number decreases sharply. The number of mesomorphic athletes increases, and in the third year, athletes with a pathological, andromorphic sexual somatotype already appear. Among 4th and 5th year students, as their sports qualifications grow, their sports experience and long-term, multi-year cumulative volume of physical activity increases, the number of mesomorph and andromorph sportswomen grows. Naturally, their level of strength, endurance, speed, physical performance, adaptive response of the body, as well as sports achievements, is significantly higher.

Conclusions

1. As age, level of sports qualification, sports experience and physical activity increase, young female athletes actively change their sexual somatotypes.

2. The ongoing dynamics in the change of sexual somatotypes, from physiological to pathological, is a direct consequence of active adaptive processes occurring in the bodies of young female athletes of different age groups, in response to many years of accumulation of physical activity.

3. The results obtained from the study conducted by the author of the article fully confirm the hypothesis put forward by him in the study conducted.

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DOI:10.31579/2767-7370/132