

Studying the Processes of Masculinization in Sexual Somatotypes, In Female Sportsmen Engaged in Wrestling

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Abstract

In this research work, the results and analysis of the study dedicated to the degree of manifestations of masculinization in sexual somatotypes in athletes of young and mature (reproductive) age involved in free and Greco-Roman (classical) struggle are presented.

Kew Words: sportswomen/female athletes; single combats; freestyle wrestling; classical wrestling; sexual somatotypes; masculinization

Introduction

Women's sport and its biological features in recent years have been the object of close study of specialists of different areas of medicine, psychology and biological sciences. A high level of loads, increased competition, the desire for victory and self-affirmation in life through sports successes and achievements-this is not a complete list of motivation for women athletes of different age groups. The mass of sports, including and the desire of women to be along with men, "conquer" male sports and achieve success in them, is characteristic of athletes, both in our country and abroad [1, 3, 7]. At the same time, often, both athletes themselves and their coaching team are not taken into account, and sometimes, the changes that take place in the body of the athletes, both adaptive (adaptive) processes in response to the presented intensive, both in frequency and in terms of frequency Their volume, physical and psychological stress in the training and consumer process of these female athletes [2, 4, 8]. Depending on the age of the athlete and the time of starting sports, as well as the specifics of this sport, somatic restructuring of many organs and systems of the female body is formed. As a result, negative changes in the metabolism, hormonal restructuring, the displacement of sexual somatotypes, disorders in the functioning of the reproductive system and other processes [2, 4, 8].

Aim of the article

The purpose of this research work is, the study and analysis, the processes of masculinization occurring in athletes of different age groups in the sexual somatotypes identified in them.

Hypothesis of the article

In the process of preparatory work for conducting this study, its author came up with a working hypothesis, the essence of which was as follows: in athletes of different age groups, as the duration and intensity of the training and competition process and the growth of their sports qualifications, adaptive processes occur in their bodies, with changes in a number of

morphofunctional index values in their initial sexual somatotypes, and with progressive phenomena in them, masculinization.

Method and materials of the study

During this study, we used methods such as: literary and critical analysis, affordable sources of both domestic and foreign authors, on the issue studied by the author, including their research articles, scientific and scientific and methodological literature. Also, anthropometry was used, with the determination of the length and weight of the body of athletes; pelvimetry, with the determination of the studied female sportsmen, a metro diameter (shoulder width) and inter-grab size (pelvic width), as well as a trochanter size (the distance between the large skewers of the femoral bone); The method of indices, with the determination of the body mass index (BMI) of female athletes, the index of sexual dimorphism (SDI), according to the formula of J. Tanner, the Masculinization Index (MI); Andromorphic index (AI); the method of mathematical statistics of the results of the study. All female athletes, in their age groups who took part in the study, gave their own voluntary, both oral and written consent to participate in it.

Abbreviations

- **BMI** - body weight index;
- **SDI** - an index of sexual dimorphism, according to the formula of J. Tanner;
- **MI** - it is the masculinization index;
- **IA** - Andromorphism index.

Results of the study and discussion

The study was attended by 14 athletes of youth age and 13 female athletes of adulthood, who are engaged in freestyle wrestling, as well as 15 female athletes of adolescence and 11 mature ages involved in the Greco-Roman (classical) struggle. Total: 29 athletes of youth and 24 female athletes of adulthood. The sports experience of athletes of youthful age is from 3 to 5

years, and in the group of female athletes of adulthood - from 3-6 to 10 years. The average age of young athletes was 15.34 ± 1.03 years, and female athletes of adulthood - 23.72 ± 1.24 years. The level of sports qualification - from I, II category among young female athletes, to a candidate for master of sports and master of sports - from senior athletes. The frequency of classes

is from 4-5 to 5-6 times a week at 1.5-2 and 2-3 hours, which are one lesson. After conducting the necessary anthropometric measurements - the length and weight of the body, the width of the shoulders and pelvis, the intervering diameter in each age group, the indicators presented in the table were determined. 1, at $p < 0.05$:

Name of the indicator	Freestyle wrestling (n = 14)	Greco-Roman struggle (n = 15)
Body length, cm	168,32±1,34	167,56±1,17
Body weight, kg	62,36±1,04	61,12±1,13
Mezapromial diameter, cm	34,64±0,73	34,89±0,79
Inter-grab diameter, cm	27,04±0,83	27,13±0,47
Intertrochanter size, cm	28,45±1,03	29,28±1,06

Table 1. Anthropometric indicators of female athletes of youth age

As can be seen from the results of anthropometry, the indicators in both groups of female athletes are close in terms of meanings to each other. It is noteworthy that in both groups of young athletes the width of the shoulders exceeds the indicators of the pelvic width. Girls broad -shouldered, with narrow basins, which corresponds to the masculine type of figure of athletes. At the same time, the values of the pelvic width correspond to their age - related parameters, as well as the trochanter (interverit) size. Both indicators are approaching the values that the athletes will have to have in 1.5–2 years:

the inter-granous diameter (pelvic width)-28-29 cm, and the interpotrochanter size (d. trochanterica)-31-32 cm [1,3,5,7]. The average values of the weighted indicators in both groups also correspond to the age standards in the population [1, 3, 5, 7]. Also, in the group of female athletes I mature (reproductive) age, after the necessary anthropometric measurements made according to classical methods, indicators were obtained that are presented in the table 2, at $p < 0.05$:

Name of the indicator	Free wrestling (n = 13)	Greco-Roman wrestling (n = 11)
Body length, cm	173,41±0,72	171,65±0,66
Body weight, kg	69,12±0,83	68,93±0,79
Mezapromial diameter, cm	37,79±0,81	37,83±0,89
Inter-grab diameter, cm	27,71±0,36	28,23±0,47
Intertrochanter size, cm	29,68±0,47	30,73±0,53

Table 2: Anthropometric indicators of athletes of the first mature age

The analysis of the obtained anthropometric indicators in the group of athletes of the I mature (reproductive) age also showed that the female athletes are close in terms of their average anthropometric indicators. The obtained dimensions of the pelvis are quite consistent with the values of the size of the bone pelvis of women in the population (29-29 cm for inter-grab diameter and 31–32 cm-for introchanther diameter) [1,3,5,7] mass-rift

proportions, in both groups of female athletes also correspond to population criteria. But, at the same time, the average values of the shoulder's width, the athletes of both groups exceed the values of the size of the pelvic width, which also indicates the masculine type of figure of female athletes [1, 3, 5, 7]. Also, morphofunctional index values in each age group were determined. The obtained indicators, among female athletes of adolescence, are represented in table. 3, at $p < 0.05$:

Name of the indicator	Free wrestling (n=14)	Greco-Roman wrestling (n = 11)
Body mass index (BMI), kg/cm ²	22,48±0,12	22,07±0,23
Sexual dimorphism index-SDI (conventional units)	88,24±0,33	79,44±0,14
Masculinization index (MI)	1,17±0,11	1,2±0,37
Andromorphia index (AI)	55,43±0,09	48,88±0,41

Table 3: Index values in female athletes of adolescence

The analysis of the obtained indicators of morphofunctional index values showed the following: the values of BMI in the young athletes of both groups are within normal limits. The average values of the SDI in the group of young female thletes involved in the Greco-Roman struggle are approaching the most boundary values of the mesomorphic sexual somatotype, despite the fact that in this age group of female athletes there are not a single one, with physiological gynecomorphic, and with pathological-andromorphic sexual somatotype [1, 3, 5, 7]. In the group of athletes engaged in freestyle wrestling, there were also no female athletes with gynecomorphic sexual somatotype. At the same time, in this group, female athletes with pathological, andromorphic sexual somatotype - 9 (64.29%) and, with

transitional, mesomorphic sexual somatotype - 5 (35.71%) dominate. The average values of the masculinization index (MI), at the female athletes of both groups, corresponds to indicators indicating the initial processes of reducing the estrogen background and the formation of hyperandrogenic phenomena (less than 1.15) [1, 3, 5, 7]. The average values of the Andromorphia index (AI) in both groups correspond to the hyperginoid type (67.5) [1,3,5,7]. Similar mathematical calculations necessary for obtaining indicators of morphofunctional index values were also carried out in the group of female athletes of adulthood. The results are presented in table. 4, at $p < 0.05$:

Name of the indicator	Free wrestling (n = 13)	Greco-Roman wrestling (n = 11)
Body mass index (BMI), kg/cm ²	23,12±0,21	23,55±0,11
Sexual dimorphism index-SDI (conventional units)	88,21±0,13	87,46±0,14
Masculinization index (MI)	1,28±0,22	1,24±0,34
Andromorphia index (AI)	55,50±0,13	50,64±0,18

Table 4: Index values in athletes of I mature age

The average group values of the body mass index (BMI), in athletes of this age group, correspond to the normative values [1, 3, 5, 7]. The average indicators of the sexual dimorphism index, in both groups of female athletes of this age group, correspond to the values of the Andromorphic sexual somatotype (more than 82.1) [1, 3, 5, 7]. At the same time, in both groups there are no athletes with physiological sexual somatotype (upper, maximum values (up to 82.1), and the number of female athletes, with a mesomorphic somatotype, in the freestyle wrestling group is 4 (30.77%), and in the classical struggle group - 3 (27.27%). The studied groups indicate the presence of hyperginoid - type female athletes (an indicator less than 67.5) [1, 3, 5, 7].

Conclusions

1. The group of young female athletes involved in the classical struggle is dominated by athletes with a mesomorphic sexual somatotype, and in the group of young female athletes involved in freestyle wrestling, female athletes with an andromorphic somatotype and masculinization phenomena are dominated, in both studied groups of hypostrogery.
2. It was established that in groups of female athletes of the past age involved in the classical and Greco-Roman struggle, masculine female athletes dominate, both with mesomorphic and mainly with inverse andromorphic sexual somatotypes.
3. We believe that the displacement of the sexual somatotype, the phenomena of masculinization and hypostrogery are formed adaptively, as a result of perennial intense physical exertion.
4. The results of the study and their analysis fully confirmed, put forward by the author of the study, a hypothesis.

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