

Studying The Features of The Menstrual Cycle in Woman Athletes of Different Age Groups Doing Women's Boxing, In Their Sexual Somatotypes

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Abstract

The article presents the results of a study of the values of the finger index in athletes of different ages involved in women's boxing. It has been established that among female athletes in all age groups studied, and especially among representatives of mesomorphic and andromorphic sexual somatotypes, manifestations of the finger proportion $2D \geq 4D$, characteristic of masculine manifestations, dominate. The results obtained correlate with certain values of the sexual dimorphism index and identified sexual somatotypes in all three study groups.

Key words: female athletes; pubertal age; adolescence; I reproductive age; ovarian-menstrual cycle; female box; sex somatotypes; adaptation

Introduction

In modern women's sports, as in all types of elite sports, research devoted to the medical and biological issues of the construction and implementation of the training and competitive process in female athletes, taking into account their age groups, is always relevant and in demand. Adaptive processes relating to the diverse somatic and psychological aspects of the life of female athletes, and their theoretical justification and practical application of the results of numerous studies are the basis for the correct understanding and correction of the adaptive processes occurring in the body of female athletes in ontogenesis. In this regard, our research is a fragment in the study of adaptive processes and medical and biological processes in modern women's sports.

When analyzing available domestic and foreign sources on the problem under study, we found that there is a fairly large number of studies and printed works examining the somatic and psychological manifestations of sexual dimorphism in female athletes in the identified sexual somatotypes [1,3,5,6]. In particular, such works include studies by such authors as: A.A. Dyusenova, E.A. Oleynik, 2013-2023; N.D. Nenenko, O.A. Abramova, N.V. Chernitsyna, R.V. Kuchin, 2014; I. Rynasaya, A. Shevchenko, I. Shevchenko, 2014; V.B. Mandrikov, R.P. Samusev, E.V. Zubareva, E.S. Rudaskova, G.A. Adelshina, 2015; K.A. Bugaevsky, 2014-2018. Issues of the influence of sports on the formation and functioning of the female reproductive system, incl. and the issues of hyperandrogenism in female athletes, were paid attention in their studies by such authors as: N.A.

Kalinina, 2004; V. Osipov, 2012; S.N. Belik, I.V. Podgorny, Yu.V. Mozhinskaya, 2014; S.G. Vasin, 2016; K.A. Bugaevsky, 2014-2023. Authors such as K.V. have devoted their research work to questions of the methodology for constructing the training and competitive process in modern women's sports. Zhuneva, E.V. Starkova, 2017; I.A. Marchenko, T.A. Mikhailova, 2017. In our opinion, the problem of the formation of the ovarian-menstrual cycle - further OMC and its dynamics, as well as the earlier initiation of intensive boxing training in girls, and its influence on the stages and development of puberty in athletes of different age groups involved in this sport - has not been sufficiently studied.

Aim of study

The purpose of the article is to review and analyze the obtained research results regarding the existing dynamics of the formation and course of the ovarian-menstrual cycle and somatic manifestations of hyperandrogenism in athletes of puberty, adolescence and first reproductive age, of different sexual somatotypes, involved in women's boxing, taking into account the values of the finger index.

Abbreviations

- **OMS** - ovarian-menstrual cycle;
- **MB** - menstrual bleeding;
- **MCD** - menstrual cycle disorders

- **SDI** - sexual dimorphism index, according to J. Tanner;
- **SW** - shoulder width;
- **PW** - pelvic width;
- **FGS** - Ferriman-Gallwey scale;
- **PMS** - premenstrual syndrome;
- **Me** - menarche (first menstruation).

Material and methods

This study was conducted on the basis of sports clubs specializing in women's boxing. It was attended by 3 groups of athletes (n=41), of different age groups, involved in women's boxing. When conducting this research, we used such methods as a pedagogical experiment, questioning, examination, interviewing, analysis of available literary scientific and scientific-methodological aids, and the method of mathematical statistics. The state of menstrual function was assessed by questionnaire, for which we used the author's version of the questionnaire (Bugavsky K.A., 2009, modification 2018-2023©) [2,4,7], interviewing. When determining the parameters of the ovarian-menstrual cycle (OMC), we assessed such informative reproductive indicators as: the age of menarche (first menstruation), the timing of the establishment of the OMC, its duration, the duration of menstrual bleeding (MB), the establishment of existing menstrual cycle disorders (MCD). Anthropometric measurements were also carried out in the studied groups of female athletes to determine the values of the index of sexual dimorphism (SDI), with the determination of such anthropometric indicators as shoulder width (SH) and pelvic width (PW), with the subsequent distribution of athletes into sexual somatotypes according to the classification of J. Tanner, as well as determination of somatic manifestations of hyperandrogenism, using the Ferriman-Gallwey scale. It should be noted that all the athletes who took part in the study gave their voluntary, written consent to participate in it.

Results and discussion

Analysis of the obtained results of the state of OMC, in the group of girls of pubertal age (n=17), we were able to establish the following: 14 (82.35%) athletes began training before menarche, and 3 (17.65%) athletes - within 1 year after the first menstruation. An analysis of the characteristics of the dynamics of OMC in the group of female athletes of pubertal age is as follows: the period of onset of menarche is 13.86 ± 0.67 years, the period of establishment of the menstrual cycle is 1.78 ± 0.54 years. The duration of the menstrual cycle is 38.83 ± 1.85 days, the duration of menstrual bleeding is 2.39 ± 0.74 days.

When analyzing the results obtained, attention is drawn to the fact that although the time of menarche corresponds to the physiological normative corridor existing in Ukraine at 12.56 ± 0.87 years, it exceeds the average values in the population [2,4,7]. Also, the timing of the establishment of the menstrual cycle in this group of female athletes is longer than the average in the population [2,4,7]. It has been established that female athletes of the pubertal age group have a slowdown in the menstrual cycle, with an extension of the onset of menstruation, above the physiological norm of 21-35 days [2,4,7].

In this group of female athletes of pubertal age, according to the data obtained, hypomenstrual syndrome begins to form, with the presence of its main components such as oligo-opsomenorrhoea and hypomenorrhoea [2,4,7]. Regarding the identified features of the menstrual cycle in this group of female athletes, it was determined that 2 (11.77%) female athletes who began training during the first year after menarche had normal, physiological parameters of the OMC. In 9 (52.94%) female athletes who started boxing before menarche, the emerging phenomena of hypomenstrual syndrome, with the phenomena of moderate premenstrual syndrome (PMS) and algodysmenorrhoea, were identified. 6 (35.29%) female athletes of pubertal age who began training within 1.5-2 years after menarche have pronounced symptoms of PMS and algodysmenorrhoea against the background of formed hypomenstrual syndrome.

In the group of female adolescent athletes (n=13), after processing and analyzing the received research materials, we obtained the following results: 10 (76.92%) female athletes began training before menarche, and 3 (23.08%) female athletes - at within 1.5-2 years after the first menstruation. Analysis of the characteristics of the dynamics of the OMC in the group of female youth athletes is as follows: the period of onset of menarche is 13.92 ± 0.65 years, the period of establishment of the menstrual cycle is 1.87 ± 0.23 years. The duration of the menstrual cycle is 40.33 ± 0.46 days, the duration of menstrual bleeding is 2.47 ± 0.53 days. In this group of female athletes, the dynamics of the OMC looks worse than in their colleagues from the group of female athletes of puberty. Menarche in this group occurred later than the statistical average for Ukraine [2,4,7]. The timing of the formation of OMC is also prolonged, the duration of the menstrual cycle is greater than the maximum physiological value of 35 days [2,4,7]. Also, less than the minimum acceptable value of 3 days [2, 11], the duration of MC was determined. It was established that in this group there were pronounced phenomena of hypomenstrual syndrome, pronounced manifestations of hypo, oligo-opsomenorrhoea [2,4,7]. In this group of athletes, 11 (84.62%) had significantly pronounced manifestations of PMS, and 2 (15.38%) had moderate manifestations. In all 13 (100.00%) athletes, algodysmenorrhoea was identified. The most diverse and richest in various variants of the dynamics of the OMC and its disorders were the results of the study in the group of female athletes of the first reproductive age (n=11). In this group, in 3 (27.27%) female athletes, manifestations of secondary amenorrhoea were reliably identified, with the absence of urinary tract in a period of 60 to 120 days [2,4,7]. In 8 (72.73%) female athletes, the menstrual cycle is still unstable, with pronounced manifestations of hypomenstrual syndrome and a tendency to the formation of secondary amenorrhoea and the appearance of PMS and algomenorrhoea. The dynamics of OMC in female athletes of the first reproductive age is as follows: the period of onset of menarche is 13.89 ± 0.77 years, the period of establishment of the menstrual cycle is 1.89 ± 0.54 years. The duration of the menstrual cycle is 48.46 ± 0.67 days, the duration of menstrual bleeding is 2.07 ± 0.23 days.

After conducting anthropometric measurements in female athletes, which included determination of shoulder width (biacromial size) and pelvic width (bicristary size), the following results were obtained, reflected in table. 1.

Indicator name	Shoulder width, (cm)	Pelvic width, (cm)
Pubertal age female athletes (n=17)	31,19±0,576	25,51±0,64
Youth age athletes (n=13)	35,47±0,63	27,14±0,23
Female athletes (n=11) I (first reproductive age)	36,76±0,63	27,74±0,43

Table 1: Anthropometric indicators in the study groups

According to the analysis of the results obtained, it can be argued that among athletes of all three groups, the shoulder width indicators significantly exceed the width of their pelvis. At the same time, in both groups, the values of the pelvic width do not correspond to the generally accepted anatomical indicators of the normal size of the pelvis (distancia cristarum), equal to 28-

29 cm [1,3,5,6]. Based on the obtained results of SW and PW, SDI values were determined with the identification of sexual somatotypes. Data on the obtained sexual somatotypes among athletes of the studied groups are reflected in table. 2.

Indicator name	Gynecomorphic sexual somatotype	Mesomorphic sexual somatotype	Andromorphic sexual somatotype
Pubertal age female athletes (n=17)	14 (82,35%) female sportsmens	3 (17,65%) female sportsmens	–
Youth age female athletes (n=13)	2 (15,39%) female sportsmens	7 (53,85%) female sportsmens	4 (30,77%) female sportsmens
Female athletes (n=11) I (first) reproductive age	–	7 (63,64%) female sportsmens	4 (36,36%) female sportsmens

Table 2. Indicators of distribution of female athletes by sexual somatotypes

In addition, in order to determine the severity of androgenization in female athletes of all study groups, we determined the values of the Ferriman-Gallwey scale in 11 areas of the body, using the classical method [1,3,5,6]. Taking into account the fact that the main inversions towards changes in SDI, in the form of dominant mesomorphic and andromorphic sexual somatotypes, were identified among athletes in groups of adolescence and first reproductive age, the determination of this indicator has important diagnostic significance [1,3,5,6]. In these groups of female athletes who have significant training and competitive experience and, accordingly, the growth of sportsmanship, sports performance and competitive success may be due to adaptive changes in female athletes of older age groups, occurring towards the masculinization of their somatic and, often, psychological indicators [1,3,5,6]. Increased performance, endurance, decreased levels of fatigue and pain threshold, the ability to withstand blows and a high pace of battle, increased levels of aggressiveness and hostility - all these qualities are characteristic of the masculine personality type [1,3,5,6]. The data obtained from the Ferriman-Gallwey scale among athletes of different age groups, female boxers, confirms this. The results obtained in the groups are as follows: values of less than 6 points were determined in all 17 (100%) female athletes of puberty, in 4 (30.37%) of adolescent age, and were completely absent in group I of reproductive age. Indicators from 6 to 8 points were completely absent in the group of reproductive age; they were determined in 6 (46.15%) female athletes of adolescence and in 6 (54.55%) of the first reproductive age. Indicators from 8 to 12 points (obvious signs of hyperandrogenism), completely absent in the group of female athletes of puberty, were detected in 3 (23.08%) female athletes of adolescence and in 5 (45.45%) of the first reproductive age.

Analyzing the results obtained, the following should be noted: the total number of athletes of the groups of youthful and first reproductive age (n=11), who had moderate manifestations of hyperandrogenism, with Ferriman-Gallwey coefficient values from 6 to 8 points, is 12 (50.00%) female athletes, or every second female athlete. And 8 (30.00%) athletes, or every third athlete, were identified with high values of this indicator. When compared with SDI indicators, we found that all athletes from both groups were representatives of groups with mesomorphic and andromorphic sexual somatotypes.

Conclusions

1. Almost all athletes of the three study groups have disturbances in the dynamics of the development and course of the OMC, with clinical manifestations of various, often combined disorders of the OMC.
2. In 3 (27.27%) female athletes of group I of reproductive age, manifestations of secondary amenorrhea, with the absence of menstrual bleeding, were reliably determined in a period of 60 to 120 days.
3. We believe that all identified changes in CMC can be attributed to the phenomena of adaptation of the body of athletes to intense physical and psycho-emotional loads.
4. The identified anthropometric indicators, against the background of inversions of the values of sexual dimorphism in all three groups, towards mesomorphic and andromorphic sexual somatotypes in female athletes, gives reason to think about significant adaptive changes in the bodies of female athletes due to intense physical activity.

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