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Research Article

Peculiarities Of the Menstrual Cycle and A Number of Morphofunctional Indicators in Female Athletes of Different Age Groups Engaged in Taekwondo

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Received Date: 07 July 2023 **Accepted Date**: 14 July 2023 **Published Date**: 24 July 2023.

Citation: Bugaevsky KA, (2023), Peculiarities of the Menstrual Cycle and A Number of Morphofunctional Indicators in Female Athletes of Different Age Groups Engaged in Taekwondo, *Clinical Research and Clinical Reports*, 2(4); **DOI:**10.31579/2835-8325/029

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Abstract

The article presents the results of the conducted study, the purpose of which was to identify possible violations of reproductive parameters in female athletes of pubertal and adolescent age, engaged in taekwondo. The values of the gender dimorphism index in the study group were distributed as follows: andromorphic somatotype in 3 (11.54%) female athletes, mesomorphic somatotype in 12 (46.15%), gynecomorphic somatotype in 11 (42.31%) female athletes. It is established that 20 (76,92 %) female athletes revealed different variants of the menstrual cycle disorders. In 18 (69,23%) female athletes identified disorders of the menstrual cycle occur on the type of hypomenstrual syndrome - with the phenomena of oligo-opsomenorrhea. It is also found that in 14 (53,85%) female athletes revealed phenomena of the stage of puberty in the form of early menarche, pubarche and telarche.

When assessing the manifestations of the degree of hirsutism on the Ferriman-Gallway scale, it was found that moderate manifestations of hyperandrogenism were detected in 4 (15.39%) female athletes, medium degree manifestations in 7 (26.92%), severe manifestations in 1 (3.85%) female athlete. Combined violations of reproductive indices, with a combination of 2-3 types of violations, were found in 21 (80,77%) female athletes.

Keywords: female athletes; taekwondo; reproductive performance; menstrual cycle; hyperandrogenism

Introduction

In recent decades, the number of women of different ages involved in various, often considered to be distinctly "male" sports has continued to grow steadily" [4, 7, 10, 16]. [4, 7, 10, 16]. These issues have been topical for many years for researchers who study various aspects and medico-biological problems of work and adaptation of the female body under intense physical and psycho-emotional loads [3, 6, 10, 12, 16]. Studies concerning various biological changes, occurring in the body of women, when they practice martial arts were not an exception.

Many works have been written about changes in the female body when practicing freestyle wrestling, sambo, judo, karate, taekwondo and other types of martial arts, which women have successfully conquered [1, 2, 5, 8, 9, 11, 13, 14, 17-20]. Taekwondo is a harmonious and rather young type of martial arts for Ukraine, which is included in the Olympic Games program, which has its own specifics of the selection and training of athletes, including women [1, 2, 5, 8, 9, 11, 13, 14, 17-20]. Issues concerning the specifics of training women in taekwondo have been dealt with by such domestic authors as V.V. Ageev, 1999; M.A. Karpov, 2001; V.A. Kashkarov, A.V. Vishniakov, 2001; Y.A. Shulika, 2007; M. Mikhailovskaya, A. Koshcheev, N.V. Bachinskaya, 2008; M. A. Vershinin, S.V. Vandyshev, 2013; O.V. Litvinova, V.A. Bomin, 2013; A.M. Simakov, S.E. Bakulev, V.A. Chistyakov, 2014; Z.A. Abiev, 2015.

The medico-biological problems of the female body when practicing sports (including taekwondo) were the object of study of such domestic specialists as I.A. Kalinina, 2003; M.S. Terzi, 2003; E.A. Ziryanova, E.I. Marova, A.V. Smolensky, 2008; A.R. Radzievsky, M.P. Radzievskaya, T.G. Dyba, 2011; D.A. Saraikin, 2012; L.A. Lopatina, N.P. Serezhenko, J.A. Anokhina, 2013; S.N. Belik, I.V. Podgorny, Y.V. Mozhinskaya, 2014; E. F. Kochetkova, O.N. Oparina, 2014; A.S. Melnikov, R.V. Levkov, 2014; D.B. Nikityuk, V.N. Nikolenko, S.V. Klochkova, 2015; K.A. Bugaevsky, 2011-2017. At the same time, when studying the available sources, we did not find any works concerning the issues of changes in the reproductive system of female athletes engaged in taekwondo.

While preparing this article, its author did not find studies concerning changes in the menstrual cycle (OMC) in female taekwondists, and in foreign researchers. Therefore, we believe that our study is an attempt to study such an important question as the influence of women's sports activities on the processes of adaptation and functioning of the female organism under intensive physical and psycho-emotional loads.

Aim of the work

The aim of the study was to present the analysis of the changes in the ovarian-menstrual cycle and a number of morphofunctional indicators revealed in female athletes of different age groups during their taekwondo training.

Hypothesis of the study

The hypothesis of this study is the assumption that under intensive, and sometimes excessive, physical and psycho-emotional loads, both in training and competition periods, young female athletes of different age groups may undergo serious changes in their reproductive system and, in particular, in their ovarian and menstrual cycle, and there are serious morphological and morphofunctional disorders affecting the sexual somatotype of female athletes actively engaged in taekwondo.

Object, material and methods of research

The object of research are features of the beginning, formation and dynamics of the menstrual cycle, sexual dimorphism, the stage of puberty and the phenomena of hyperandrogenism in female athletes of pubertal and adolescent age engaged in taekwondo. We used such methods of research as analysis of available literary sources, questioning - using the author's version of the questionnaire (K.A. Bugaevsky, 2009) to determine the features of the menstrual cycle and the stage of puberty in female athletes, teaching observation, anthropometry, method of indices, Ferriman-Gallvey scale, interviewing, method of mathematical statistics. All female athletes who took part in the study gave their voluntary consent to participate in it.

Results of the study and discussion

This study was conducted in January-February 2021-2022, on the basis of a number of sports clubs in the Kherson region, Ukraine, specializing in conducting training and competitive activities in taekwondo, in young female athletes, pubertal and adolescent age. Young female athletes (n=26), both pubertal (n=12) and adolescent (n=14) age, took part in the study. The average age of athletes in the 1st group was 14.87±0.87 years, in the 2nd group - 20.26±0.35 years, corresponding, respectively, to the pubertal and adolescent age [4, 12, 15]. The period of training in this sport was from 2 to 4 years in the group of athletes of pubertal age, and from 5 to 12 years in the taekwondo female teenagers. The frequency of exercises - from 4-5 times a week for 1.5-2 hours with female athletes of puberty age, up to 5-7 times a week, from 2 to 3 hours with female teenage athletes. The level of sports qualification - from the first category up to the masters of sports. Among the athletes there are champions and winners of competitions of different levels (Cup championships) both in Ukraine and abroad. After performing the necessary anthropometric measurements determination of shoulder width (SW) and pelvic width (PW) [4, 12, 15], we carried out somatotyping in the group of female athletes of both pubertal and adolescent age. The obtained data of the distribution of female athletes of both groups according to gender somatotypes when determining the gender dimorphism index (GDI) according to J. Tanner and W. Marshall [4, 10, 12], are presented in Table 1:

№	Name of the indicator	Andromorphic sexual somatotype	Mesomorphic sexual somatotype	Gynecomorphic sexual somatotype
1.	Female athletes of pubertal age (n=12)	No	3 female athletes 25,00%	9 female athletes 75,00%
2.	Female youth athletes (n=14)	3 female athletes 21,43%	9 female athletes 64,28%	2 female athletes 14,29%

Table 1: Values of sexual somatotypes in the studied groups (n=26), (%)

It is noteworthy that in the group of female athletes of pubertal age, with 2 to 4 years of taekwondo training, with the absence of female athletes with andromorphic sexual somatotype and the overwhelming number of female athletes with gynecomorphic sexual somatotype, the group of female athletes with indicators corresponding to the mesomorphic sexual somatotype already begins to form. The mean value of SDI in this group of athletes was 67,35±1,12 ($p<0,05$). This corresponds to the values of the gynecomorphic somatotype (less than 73.1) [4, 10, 12]. In young female athletes, with increasing age, duration of their taekwondo training and increasing sport qualification, there are dramatic changes in the values of the SDI indicators and in the presence of non-female sexual somatotypes. The total number of athletes with andromorphic and mesomorphic gender somatotypes is 12 (85.71%) of all athletes in this group (n=14). The mean value of the SDI values in this group of athletes was 81,43±0,78 ($p<0,05$). It corresponds to the values of mesomorphic somatotype (73,1-82,1) [4, 10, 12]. The number of female athletes-mesomorphs is high enough that indicates the intensity of their somatic changes directed to the androgenization of their organism, directly connected with the duration and intensity of physical and psycho-emotional loads in their sport activity [4, 10, 12]. When studying the stage of puberty in female athletes in both groups, the features presented in Table 2 were revealed:

№	Name of the indicator	The normal stage	Early menarche	Early Telarche	Combined changes
1.	Female athletes of pubertal age (n=12)	7 female athletes 58,33%	3 female athletes 25,00%	1 female athletes 8,33%	2 female athletes 16,67%
2.	Female youth athletes (n=14)	5 female athletes 35,71%	5 female athletes 35,71%	4 female athletes 28,57%	7 female athletes 50,00%

Table 2: Changes in the stage of puberty in the groups

When analyzing the data obtained, it is noteworthy that in both groups there are female athletes who have disorders in the stage of puberty, often combined. During the guided interviewing, it was found that all athletes in both groups with these disorders started their sports activities during the prepubertal period, at the age of 6 to 8 years. The other group consisted of athletes with a physiological stage of puberty process, in both age groups. Their number is 12 (42.86%) girls who started sports activities after the physiological onset of their telarche, pubarche and menarche [4]. After conducting a questionnaire on the peculiarities of the menstrual cycle in both age groups, we obtained the data presented in Table 3:

№	Name of the indicator	Female athletes of pubertal age (n=12)	Female youth athletes (n=14)
1.	The time of menarche	12,63±0,63 years	13,46±1,23 years
2.	Time of establishment of the menstrual cycle (OMC)	1,35±0,57 years	1,52±1,44 years
3.	Duration of the menstrual cycle	21,12±1,27 day	20,56±0,47 day
4.	The duration of menstrual bleeding	2,74±0,42 day	2,09±0,24 day

Table 3: Peculiarities of the menstrual cycle in the groups (n=26), (M±m)

As can be seen from the above data, the timing of menarche and menstrual cycle (OMC) in the group of female athletes of pubertal age correspond to the average Ukrainian rates of menarche [4, 11, 14, 16, 17]. In our opinion, in this group of female taekwondist female athletes there is the formation of the phenomena of hypomenstrual syndrome with the formation of oligo-opsomenorrhea in the group [4, 14, 16]. In the group of teenage athletes, the indicators of the onset and formation of the menstrual cycle, although they fit into the average indicators in Ukraine, but are still more their [4].

In this group of athletes also formed the phenomena of hypomenstrual syndrome, with obvious manifestations of oligo-opsomenorrhea, namely: the duration of menstrual bleeding less than 3 days and the duration of the menstrual cycle less than 21 days, with the presence of scarce menstrual discharge in most female athletes [4, 14, 16]. Only 4 female athletes in this group, or 33.33%, had a normal menstrual cycle.

In addition, according to the data of questioning and interviewing we managed to establish that 9 (75,00%) girls of the first group have premenstrual syndrome (PMS) and the phenomena of algo-dysmenorrhea, in 3 (25,00%) female athletes menstrual cycle corresponds to the norm. In the group of teenage athletes, only 2 of them, defined a normal menstrual cycle, and 12 (85.71%) athletes, there are combined disorders of the menstrual cycle, including PMS and algo-dysmenorrhea [4, 14, 16]. This group of athletes with a variety of menstrual cycle disorders included all athletes who had different variants of the stage of puberty and who started sports activities before puberty, as well as those who had 5 or more years of experience in sports. All of them noted frequent, long training and intensive physical and psycho-emotional loads in their training and competitive micro-, meso- and macro-cycles.

Abbreviations

- **SW** - shoulder width;
- PW - pelvic width;
- **GDI** - the sexual/gender dimorphism index;
- **OMC** - the menstrual cycle;
- **MB** - menstrual bleeding;
- **PMS** - premenstrual syndrome.

Conclusions

1.In the values of the index of sexual dimorphism and in certain somatotypes dominate 57.69% andromorphic and mesomorphic sexual somatotypes determined in 15 (57.69%), gynecomorphic somatotype determined in 11 (42.31%) female athletes.
2.It was found that 20 (76.92%) female athletes identified different variants of menstrual cycle disorders.
3.The phenomena of pubertal stage disturbances have been detected in 14 (53,85%) female athletes, moderate manifestations of hyperandrogenism have been identified in 4 (15,39%) female athletes, manifestations of medium degree in 7 (26,92%), expressed manifestations in 1 (3,85%) female athlete.
4.Combined disorders of several reproductive indices were detected in 21 (80.77%) female athletes.
5.The analysis of the available disorders of reproductive system, in correlation with the frequency and intensity of the training and competition cycle in female athletes, clearly indicates the formation of adaptive processes in the majority of them to intense physical and psycho-emotional loads.

References

1. Abiev Z.A. (2015). Construction of micro-cycles of training loads in the preparatory period of the annual cycle of training taekwondists 13-15 years: dissertation. candidate of pedagogical sciences special. 13.00.04 "Theory and methodology of physical education, sports training, recreational and adaptive physical culture. FGBU FNTS VNIIFK. Moscow, 152.
2. V.V. Ageev, VNIIFK (1999). Improving the effectiveness of the training process of female athletes in taekwondo in the preparatory period Abstract of thesis for the degree of candidate of pedagogical sciences special. 13.00.04 "Theory and Methodology of Physical Education, Sports Training, Recreational and Adaptive Physical Education. Moscow, 24.
3. Belik SN, I I.V. Podgorny, Yu.V. Mozhinskaya (2014). Influence of sports activity on reproductive health of girls Proceedings of the Sociosphere Research Center, 33:103-111.
4. Bugaevsky KA (2015). Menstrual cycle disorders, hyperandrogenism and sports Medical and physiological bases of adaptation and sports activities in the North: Proceedings of the All-Russian International Scientific and Practical Conference. Syktyvkar, 6-9:13-15.
5. Vershinin MA, SV. Vandyshev (2013). Concept of complex sports selection in taek wondo Fundamental'nye issledovanie, 11-4:751-756.
6. Kalinina IA, (2003). Hyperandrogenic disorders of the reproductive system in female athletes MOSCOW ALL-RUSSIAN SCIENTIFIC RESEARCH INSTITUTE OF PHYSICAL CULTURE, 198.
7. Karpov MA, (2001). Individualization of educational and training process of young taekwondists at the stage of initial sports specialization: DKPN Chelyabinsk, 162.
8. Kashkarov VA, O.N. Oparina, AV. Taekwondo (WTF), (2001). The educational program for Children and Youth Sports Schools, School of High School and Sport Schools Moskow EDIT LGPU, 72.
9. Kochetkova EF, O.N (2014). Oparina Features and problems of sexual dimorphism in sport E.F. Kochetkova Modern scientific research and innovations. 7:15-20.
10. Litvinova OV, V.A. (2013). Bomin Health-saving orientation in the development of methods of training sessions on taekwondo Actual problems of physical education and physical culture education in Eastern Siberia materials of All-Russian scientific-practical conference of students and young scientists (26 April 2013). Irkutsk: publishing house OOO "Megaprint", VOL. I. 267-270.
11. Lopatina LA, NP. Serezhenko, JA. (2013). Anthropometric Characteristics of Girls by J. Tanner Classification Fundamental Research, 2-3:504-508.
12. Melnikov AS, R.V. Levkov (2014). Morphological indices of taekwondists of different years of training Actual problems of fire, tactical and special and professional-applied physical training II International scientific and methodical conference. Mogilev, November 28, 105-110.
13. Mikhailovskaya M, A. Koscheev, NV. Bachinskaya, (2008). Features of methods of development of speed-force qualities at taekwondistok 12 15 years in different phases of the CMC Pedagogy, psychology and medical and biological problems of physical education and sports, 1:105-107.

14. Nikityuk DB, VN. Nikolenko, SV. Klochkova, (2015). Body mass index and other anthropometric indicators of physical status taking into account age and individual-typological features of the constitution of women Nutrition, 4:47-54.
15. Radzievsky AR, MP. Radzievskaya, TG. Dyba, (2023). On violation of the menstrual cycle of female athletes during adaptation to great physical exertion [Electronic resource].
16. Saraikin DA, (2012). Functional state of the organism of young athletes at different stages of the training process taekwondo Ph. Candidate of Biology specialty 03.03.01 'Physiology' Saraikin Dmitriy Andreyevich, Chelyab, state pedagogical university Chelyabinsk, 162.
17. Terzi M.S, (2003), Physiological features of adaptive processes in adolescents during taekwondo training: abstract of thesis for the degree of candidate of biol. Sciences specialty 03.00.13 "Physiology"; CHPU. -Chelyabinsk, 24.
18. Shulika YA. Taekwondo, (2007). Theory and Methods. The athlete fromRostov-on- Don: Phoenix, 800.

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