

Formation and Dynamics of The Menstrual Cycle in Female Athletes of Different Age Groups in Cycling

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Abstract

The article presents the results of a study on the sacred establishment of the relationship between the beginning of cycling and the beginning of the first menstruation, the formation, formation and dynamics of the ovarian-menstrual cycle. It was established that the beginning of this sport for girls of puberty and adolescence affects their reproductive function in the form of numerous combined cyclic disorders and quantitative and qualitative changes in the menstrual cycle. This applies mainly to the clinical manifestations of hypomenstrual syndrome and the diverse manifestations of premenstrual syndrome.

Key words: female athletes; cycling; ovarian-menstrual cycle; menarche; hypomenstrual syndrome; premenstrual syndrome

Abbreviation

ME – first menstruation;

PMS – premenstrual syndrome;

OMC – ovarian-menstrual cycle;

MB - menstrual bleeding;

MS – the master of sports;

KMS – the candidate for the master of sports.

Introduction

Every year more and more girls and young women join the ranks of active physical education and sports. One of the sports in which they are actively involved is cycling. There are a large number of sports sections and clubs where female athletes train and improve their sports skills. The development of cycling in all its diversity contributes to the fact that cycling is actively promoted as an element of a healthy way of life in many countries around the world. Our country is no exception in this matter. Girls and young women of prepubertal, pubertal, adolescent age, as well as young women of I reproductive age come to the cycling sections. Engagement in cycling requires a fairly high level of physical fitness, strength, endurance, coordination, good health [1,2]. Also, this sport requires an adequate response of the female body, in the form of a balanced adaptation, to the high level of physical and psychological stresses characteristic of this sport [1,2]. According to a large number of modern scientific studies devoted to the

adaptive capacity of female athletes, the key point in this process is the adaptation processes occurring in their endocrine and reproductive systems [1-8]. Predictor in the issue of reproductive disorders of any woman, including the athlete, are violations of her menstrual cycle [1-8]. Also, very important and, not to the end studied, is the question of the relationship between the beginning of the menstrual process and the time of the beginning of intensive training of a particular sport [1-4,6].

Aim of the work

To determine the existing violations of the formation and dynamics of the menstrual cycle in female athletes of pubertal and adolescent age engaged in cycling and their relationship with the existing physical and psycho-emotional loads.

Research objectives

1. To identify and experimentally demonstrate the relationship between the identified ovarian-menstrual cycle disorders and the time of initiation into cycling, before menarche (Me), during the formation of the ovarian-menstrual cycle, and/or after its establishment.
2. For this purpose - to conduct a questionnaire and, if necessary, additional interviewing of sportswomen in 2 groups, to reveal their individual features of menstrual cycle and PMS.

3. In the course of this study, one of its tasks will be to study the revealed disorders of menstrual cycle in this group of female athletes.

Material and methods

To conduct the study, we used the author's version of the questionnaire (Bugaevsky K.A., 2018) on the features of formation and dynamics of OMC in female athletes, we used interviewing methods, mathematical statistics, using Student's t-criterion, analysis of available literature and scientific and methodological sources on the issue under study. To assess the identified variants of PMS manifestations, its modern classification, accepted in scientific circles, including in Ukraine, was used [4,8].

Results of the study and discussion

Name of the indicator	Starting a sport before the onset of Me	The beginning of sports in the period of formation of the OMC	Beginning of sports after the establishment of OMC
Female athletes of pubertal age (n=29)	14 (48,28%)	7 (24,16%)	8 (27,59%)
Female athletes Of youth age (n=39)	21 (53,85%)	11 (28,21%)	7 (17,95%)

Table 1: Start times for sports and their relationship to OMC

As can be seen from the results obtained, in both groups of female athletes (n=68), an overwhelming number of young cyclists, or one in two of all female athletes, started their cycling activities before their first menstruation (Me) - 35 (51.47%) and 18 (26.47%), more than one in four, in an important period of ontogenesis - during the formation of their reproductive function. Only 15 (22.06%) of all female cyclists, started their cycling activities within 1-2 years, after their OMC was established. During further analysis of the

The basis for the study were sports sections and clubs involved in the training of female road cyclists from several regions of Ukraine. A total of 68 female athletes took part in the study. Of them - 29 female athletes of pubertal age and 39 female athletes of adolescent age. The level of sportsmanship - from I sports category, the candidate for the master of sports (KMS) and the master of sports (MS). Mode of training - from 5-6 to 7 times a week, 2.5 - 3.5 hours per training. At the beginning of the study we studied the relationship between menarche (Me), or first menstruation, and the time of the beginning of intensive training in this sport. Athletes of both age groups who already had a history of menstrual bleeding were recruited for the study. After questioning and interviewing the following results were obtained ($p \leq 0,05$), shown in Table 1:

results of the questionnaires and interviews, a number of female athletes from both groups were determined to have OMC abnormalities. We identified diagnostic criteria of BMC changes such as the time of OMC establishment, duration, frequency and volume of menstrual bleeding (MB), as well as the presence or absence of physical and psychological manifestations of premenstrual syndrome (PMS) in female athletes. The data obtained in female athletes of pubertal age are presented in Table 2:

The time of menarche	Time of menstrual cycle (OMC) establishment	Duration of menstrual cycle (OMC)	Duration of menstrual bleeding (MB)
13,53±0,56 years	2,16±0,39 years	39,44±0,48 day	2,12±0,27 day

Table 2: OMC dynamics in female athletes of pubertal age (n=29) ($p \leq 0,05$)

The results obtained point to a later Me debut than in the population of Ukrainian girls of the corresponding age - at 12.4 years [2-5,7,8]. In addition, in this age group, the duration of OMC has changed, with the average physiological norm of 21-35 days [2-5,7,8], i.e. menstrual bleeding in girls has become rarer in frequency of occurrence. And MB itself, also decreased in duration, in comparison with its average physiological norm of 3-7 days [2-5,7,8]. According to the data of interviewing and questioning of female athletes it was found that the volume of menstrual blood, became less, MB is more scanty than it was before. The most pronounced changes in the characteristics of menstrual cycle and its disorders were found in the group of athletes who started sports activities before the onset of Me - in all 14 girls, in 5 (71.43%) athletes who started sports activities during the formation

of menstrual cycle, and in 3 (37.50%) athletes who started sports activities after the beginning and establishment of menstrual cycle. Only 5 (17.24%) female athletes of this age group (all started sporting after the establishment of OMC), were found to have close to physiological OMC [2-5,7,8]. The results obtained indicate the formation in the group of female athletes of pubertal age, primarily in those girls who started intensive sports activities both before the onset of their Me and during the formation of their OMC. They develop OMC disorders such as oligomenorrhea, hypomenorrhea and opsomenorrhea [2-5,8].

In the group of junior female road cyclists, we also analyzed the obtained data on the dynamics of OMC. Its results are presented in Table 3:

The time of menarche (Me)	Timeframe for establishing the OMC	Duration of the OMC	The duration of menstrual bleeding
13,61±0,65 years	2,18±0,52 years	41,04±0,53 day	2,07±0,19 day

Table 3: Dynamics of BMC of female youth athletes (n=39) (p≤0.05)

As follows from the data of the study, in the group of young female athletes also identified violations of the formation and dynamics of menstrual cycle in the form of later than in the population, the time of the appearance of Me, a longer period of establishment of menstrual cycle, increasing, above the physiological norm, the pause time between OMC and, therefore, less menstrual bleeding, and reduction in both the volume and duration of the

menstrual bleeding itself. These results clearly indicate the formation in this group of female athletes, persistent hypomenstrual syndrome (Hypo MS), with its characteristic clinical manifestations of oligo, hypo-opsomenorrhea [2-5,7,8]. Also, it was found that a number of female athletes of both groups have manifestations of premenstrual syndrome and clinical manifestations of algodysmenorrhea. Our results are presented in Table 4:

Name of the indicator	Somatic manifestations of PMS	The psychological manifestations of PMS	Combined manifestations of PMS
Female athletes of pubertal age (n=29)	12 (41,38%)	9 (31,03%)	6 (20,69%)
Female athletes youth age (n=39)	23 (58,97%)	9 (23,08%)	7 (17,95%)

Table 4: Manifestations of PMS in the studied groups of female athletes

The results indicate the prevalence of such somatic manifestations of PMS as abdominal pain, breast engorgement, headache and a number of others, to psychological manifestations - irritability aggressiveness, tearfulness, irritability, apathy, lethargy, retardation, depression, vegetative and other manifestations [4,8]. Naturally, these manifestations of PMS and their

combinations, are a manifestation of a number of somatic and neuro-endocrine disorders in the body of young female athletes. It was found that the manifestations of PMS in both groups of female athletes have varying degrees of severity - from a moderate, average degree and a pronounced degree of manifestations. The results of PMS manifestation are presented in Table 5:

Name of the indicator	Mild degree of PMS manifestations	Medium degree of PMS manifestations	Expressed degree of PMS manifestations
Female athletes of pubertal age (n=29)	19 (65,52%)	8 (27,59%)	2 (6,90%)
Female athletes youth age (n=39)	13 (33,33%)	20 (51,28%)	6 (15,39%)

Table 5: Severity of PMS manifestations in both groups of female athletes

According to the results of the questioning and additional interviewing it was established that in the whole group (n=68), the light degree of PMS manifestations was determined in 32 (47,06%) athletes, the average degree - in 28 (41, 18%) cyclists. And 8 (11,77 %) female athletes have expressed manifestations of PMS, often combined somatic and psychological manifestations.

Conclusions

1. In female athletes of pubertal and adolescent age, at the beginning of cycling before menarche and at the

- beginning of formation of OMC, under the influence of intensive physical and psychological loads, reproductive system disorders are formed.
2. The disorders are characterized, in the vast majority of cases, in the delayed timing of formation and formation of the main parameters of OMC, with diverse, often combined clinical variants.
3. The correlation between the duration and intensity of the competitive training regime of sportswomen and progressing of OMC disturbances in the form of

hypomenstrual syndrome and premenstrual syndrome phenomena has been revealed.

- The greatest number of detected disorders of OMC and its indicators was determined in female athletes who started their sports activities before menarche and in the initial stages of OMC formation, with multiple disorders in the process of its dynamic development.

Conflicts of Interest: The author notes the complete absence of any conflicts of interest.

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