

Research Article

## Review and Analysis of the Relationship between the Time of the First Menstruation in Pubertal Female Athletes and the Time of Their Start in Sports

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### Annotation

This author's research article presents the results and analysis conducted by the author of the study, the purpose of which was to establish a possible relationship between the timing of the onset and possible individual characteristics of the dynamics of the formation and course of the ovarian-menstrual cycle (hereinafter OMC) in 143 female athletes, with terms, their active initiation into activities, in 10 different types, of modern women's sports, in comparison with their peers who do not go in for sports in the control group.

**Keywords:** Pubertal Female Athletes, Control Group of Young Female Non-Athletes, Time of Start of Sports, First Menstruation, Relationship, Ovarian-Menstrual Cycle.

### 1. Introduction

The study of issues related to the health of young people, including university students, is very relevant and in demand! In the modern world of women's sports, research related to medical and biological problems in different age periods of female athletes is very relevant. The demand for such research is due to many years of discussion between specialists from different countries regarding the influence of intense physical activity on the female body and its impact on the function of the female reproductive system - both on the ovarian-menstrual cycle, which is a marker of the functioning of this system, and on fertility (fertility) female athletes in the future, if they have a desire to have children, both during their sports career and after its completion [1-8]. Researchers disagree on what, first of all, is the cause of the detected disorders of the OMC and fertility in female athletes, putting forward their own assumptions and arguments. Some authors believe that these disorders are influenced by the selective selection of young athletes into one sport or another, with the selection of girls with an initial masculine somatotype and certain physical qualities [6, 7].

The second researchers believe that the cause of inversions of sexual somatotypes and the totality of detected disorders in the reproductive and endocrine systems are intense, and sometimes inappropriately intense, physical and psychological stress imposed by the coaching team in order for the athlete to obtain the desired result [1, 8]. According to others, the reason for future pathological changes in OMC and fertility lies in the fact that young athletes begin their intensive training in one sport or another at a very early age, before the appearance of their first menstruation (menarche, hereinafter Me) [2, 3, 6].

And finally, there is a fairly large group of specialists in the field

of sports medicine, studying the characteristics of medical and biological problems in women, who believe that the identified disorders in athletes are caused by the combination of all the above etiological factors, as a result of adaptive changes in organism's athletes of all age groups. This especially applies to those young athletes who began their training in one sport or another before their me debut [2, 3, 6].

#### 1.1. Abbreviation

- **OMC** - ovarian-menstrual cycle;
- **Me** – first menstruation.

#### 1.2. Aim of study

The purpose of this article is to present the results of the study conducted by the author and their analysis, in comparison with the indicators obtained from a group of female peers, not athletes, in the control group, to identify possible pathological changes. The purpose of our study was to track the relationship between me delay, the dynamics of the establishment of OMC and its dynamics in pubertal female athletes involved in different sports.

### 2. Material and Methods

When writing this research article, its author used research methods such as search, thematic text selection, and literary critical analysis of the selected materials necessary for writing this article, available information on the issue under study. Also, an anonymous survey of all participants in the study was conducted. The method of mathematical statistics was used to process the results of the study.

### 3. Results and Discussion

The following sports were represented: artistic gymnastics -

15 female athletes, rhythmic gymnastics – 14 female athletes, volleyball – 19 female athletes, basketball – 17 female athletes, cycling - 13 female athletes, kayaking and canoeing - 12, freestyle wrestling - 15, taekwondo – 14 female athletes, boxing - 13 female athletes, athletics (middle distance running) - 11 female athletes, total - 143 female athletes. A mandatory condition for the selection of female athletes into the study groups was the time they started playing sports - before the onset of me. For comparison, we selected a control group of girls of the same age from the population of their peers who do not go in for sports, numbering 145 people.

The average age of the athletes in all study groups was  $15.36 \pm 1.12$  years, and in the control group –  $15.27 \pm 0.83$  years. The average frequency of sports activities for all study groups

was from 5 to 6 times a week, 1.5-2.5 hours per session. This study was carried out with the mandatory consent of the athletes' parents, coaching teams and, with the voluntary consent of the athletes themselves. To conduct the research, we used the author's questionnaire (Bugaevsky K.A., 2018©), the method of extended interviewing, the method of literary analysis of available sources of information on the issue under study, the method of mathematical statistics.

After receiving completed questionnaires and conducting additional (if necessary) interviews, studying and analyzing the results obtained, we obtained data on the debut of Me and the timing of the formation of OMC, which we presented in the table, at  $p < 0.05$ :

**Table 1: Comparison of the Debut of me in the Study and Control Groups**

Indicator name	Time of debut Me (years)	Time frame for establishing OMC (years)
Sportig Gymnastics (n=15)	14,56±1,03	1,78±0,83
Art Gymnastics (n=15)	14,86±1,11	1,84±0,79
Volleyball (n=15)	13,57±0,11	1,63±0,64
Basketball (n=17)	14,12±0,33	1,59±0,84
Cycling (n=13)	13,73±0,56	1,53±0,29
Kayaking and canoeing (n=12)	14,79±0,41	1,89±0,69
Freestyle wrestling (n=15)	13,54±0,63	1,49±0,39
Taekwondo (n=14)	13,78±0,23	1,64±0,32
Boxing (n=13)	14,21±0,32	1,61±0,66
Athletics (middle distance running) (n=11)	14,22±0,23	1,84±0,29
Total female athletes (n=143)	14,65±0,73	2,40±0,47
Control group of girls (n=145)	12, 24±0,64	1,37±0,86

As follows from the analysis of the obtained results of the debut of Me and the time of formation of their OMC, in athletes involved in artistic and rhythmic gymnastics, kayaking and canoeing, the period of onset of Me is noticeably prolonged, compared with girls from the population; in other groups of athletes, the onset time Me, although it fluctuates within the conventionally acceptable limits of this age group, is at the level of the upper limits of the age group.

Also, in all study groups, the timing of the establishment of OMC, after the onset of menarche in girls, is significantly greater than the permissible physiological norm of 1-1.5 years in the population [2-4, 5, 7], and also compared with indicators in the control group.

The greatest delay in establishing (stabilizing) the timing of the OMC was found in young athletes in artistic and rhythmic gymnastics, kayaking and canoeing, athletics (middle distance running), volleyball, basketball and boxing. The closest values for the debut of me and the establishment of OMC were recorded

among athletes involved in such types of martial arts as freestyle wrestling and taekwondo and, partly, in cycling.

### Conclusions

Based on the results of the study, it can be argued that there is a relationship between the time of the start of sports and the debut of menarche. For all athletes, in each of the presented groups, the timing of the debut of me and the onset of the establishment of OMC is extended. In our study, sports such as artistic and rhythmic gymnastics, kayaking and canoeing turned out to have the most influence on disturbances in the debut of me and the formation of OMC. Taking into account the intensity, volume and duration of sports, as well as, in conjunction with the established relationship between the start of sports and the timing of menarche, it can be argued that this dependence is one of the important etiological factors in the onset of ovarian-menstrual cycle disorders, in particular, and a malfunction in the reproductive system of female athletes in general, as a result of the adaptation of their body to the physical and psychological stress they have.

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