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INFLUENCE OF THE PREMENSTRUAL SYNDROM ON THE EMOTIONAL CONDITION OF FEMALE ATHLETES

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Abstract: *Following a review of MEDLINE world data base we found out that research of the premenstrual syndrome on female athletes was insufficient. The goal of this study is to examine its influence on the female athletes emotional health. The working hypothesis assumes that the stronger the premenstrual syndrome, the more negative influence it has on the emotional conditions of female athletes. A survey regarding the premenstrual syndrome and emotional conditions of female athletes was duly implemented. It shows the proportion of athletes' distribution with regard to the number of indicated symptoms as well as some more repeated ones. The results were analyzed. Based on the above mentioned survey we drew the following conclusions: Only a small part of the female athletes do not have a premenstrual syndrome; With the increase of premenstrual syndromes, statistically their negative impact on the emotional condition of the female athletes is significantly increased; Further researches should be made to find the influence of the premenstrual syndrome on female athletes in view of improving the sports achievements*.

Key words: *premenstrual syndrome, athletes.*

1. Introduction

The influence of the premenstrual syndrome on female athletes is an issue which lacks an extensive research in the world. The specificity of the syndrome presupposes an influence on the athlete's competition performance. Athletes are pushing the limits to achieve best results. It is necessary to carry out a thorough study on any possible influence on athletes in order to augment their performance.

A wide range of physical or emotional symptoms have been associated with premenstrual syndrome (PMS). By definition, symptoms are considered to be PMS-related if they occur during the second half of the menstrual cycle (14 days or more after the first day of the menstrual period) and are absent for about 7 days after a menstrual period ends (during the first half of the menstrual cycle).

The most common symptoms include: headache; swelling of ankles, feet, and hands; backache; abdominal cramps or

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heaviness; abdominal pain; abdominal fullness, feeling gaseous; muscle spasms; breast tenderness; weight gain; recurrent cold sores; bloating; constipation or diarrhea; decreased coordination; food cravings; less tolerance for noises and lights; difficulty concentrating; depression; Irritability, hostility, or aggressive behavior; Increased guilt feelings; fatigue; slow, sluggish, lethargic movement; sex drive changes, loss of sex drive; low self-esteem (MedlinePlus: Medical Encyclopedia).

2. Purpose

The goal of this research work is to find the influence of the premenstrual syndrome on the female athletes' emotional condition.

3. Hypothesis

Our working hypothesis assumes that the stronger the premenstrual syndrome, the more negative influence it has on the emotional condition of female athletes.

4. Research Methods

Our survey covered 26 female athletes, students at the "Vassil Levski" National Sports Academy,Sofia, Bulgaria. Representatives of different sports were inquired. Most of them practiced track and field athletics, gymnastics, ball games, wrestling, military arts, shooting.

We have enclosed a questionnaire form studying the premenstrual syndrome of female athletes, showing the presence of premenstrual syndrome symptoms. Eight most repeated symptoms were included like: frequent change of mood, fatigue, concentration difficulty, depression, nervousness and irritability, nausea, swelling of ankles, feet and hands, weight gain.

Athletes' emotional condition was studied through a standard questionnaire for Quality of Life, 36-item survey (SF-36). It analyzed the issues related to the emotional condition.

5. Results

The average age of the inquired athletes was 19. Fig. 1 shows the distribution of the proportion of athletes according the number their symptoms.

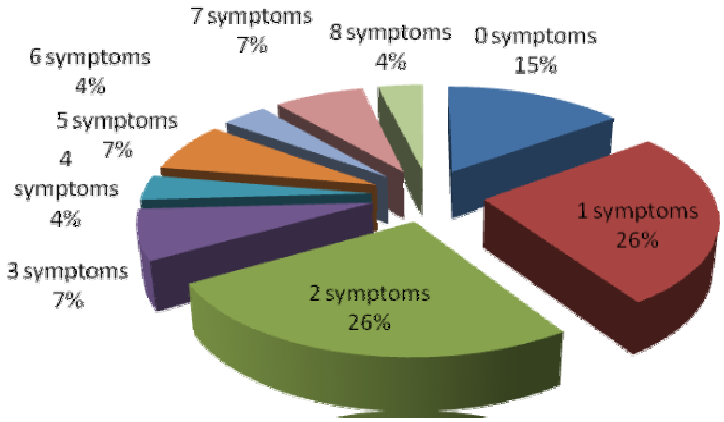

Fig. 1. *Distribution of the proportion of athletes according to the number of symptoms* (n=26)

Only 15% of the athletes have no premenstrual symptoms. 26% of them had felt one or two of the premenstrual symptoms. 7% indicated of having three, five or seven symptoms. 4% had four, six or all eight symptoms. The results show that bigger part of the female athletes has one to three symptoms of the premenstrual syndrome.

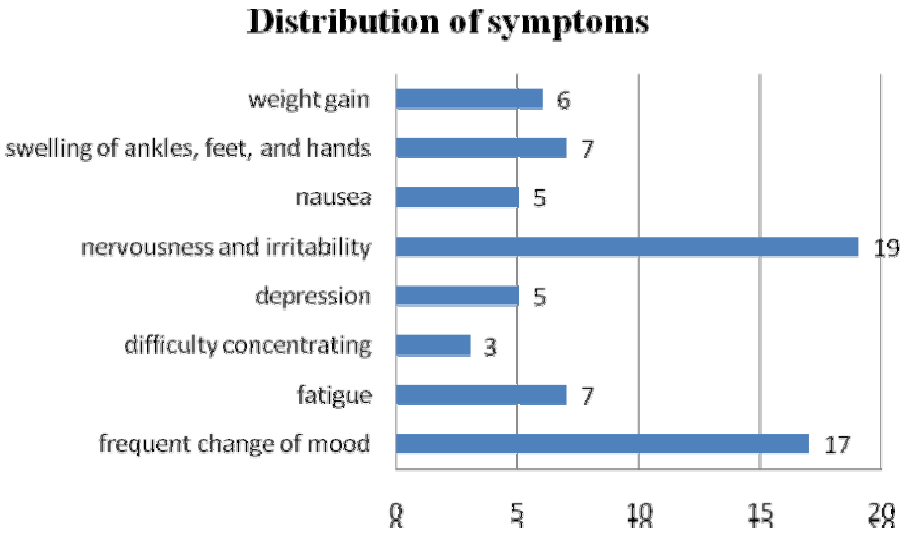

Fig.2. *Distribution of symptoms*

Fig. 2 shows distribution of symptoms. The most recurring are nervousness, irritability and frequent change of mood. They occurred 19 and 17 times respectively. The distribution of the other symptoms is as follows: fatigue and swelling of ankles, feet, hands – 7 times; weight gain – 6 times; depression and nausea – 5 times; difficulty concentrating – 3 times.

Considering the presence of symptoms of premenstrual syndrome we split the athletes in two groups. The first one includes the athletes of zero to three symptoms, while the second one contains the athletes of four to eight symptoms.

Upon the completion of SF-36 we calculated the points of each athlete. Considering the results we made the following table:

Table 1

	n	$\bar{x}$	$\sum x$	$\sum x^2$	**S**
0-3 symptoms	19	74,14	1540	121168	14,24
4-8 symptoms	7	60,66	444	30800	20,96

The following formula was used for calculating S:

$$S= \sqrt{(\sum x-\sum x^2/n)\ n-1};$$

Nineteen athletes suffered from zero to three premenstrual syndromes. The average value of the points corresponding to the emotional condition of the athletes with regards to SF-36 is 74, 14. With the second group of athletes (n=7) the average value is 60.66. Both groups have gathered less number of points than the norm of 74,7 according to SF-36 for the emotional health. There is a tendency that the premenstrual syndrome has a negative influence on the emotional health. In order to verify whether this tendency is significantly greater with the women having more symptoms, we used t-criterion of Student for independent samples. The empirical value of the criterion was calculated by the following formula:

$$t\ emp = (\bar{x}1- \bar{x}2)/ \sqrt{((n1-1)\times S1^2 + (n2-1)\times S2^2/\ n1+n2-1)\times ((n1+n2)/(n1\times n2))}$$

The obtained empirical value of the t-criterion of Student is 7, 16. The theoretical value of this criterion at α=0,001 is 3, 75. The results show that temp > tα and based on this we can reject the zero hypothesis and can confirm our working hypothesis. Therefore it is statistically verified that the increase of the symptoms increases their negative impact on the emotional condition of the tested athletes.

6. Discussion

Following a study of MEDLINE world data base with key words Premenstrual Syndrome and Athletes, we found very little publications covering both issues. Part of these researches was orientated towards the influence of the physical exercises on the menstrual cycle. Prior JC and Vigna Y. (1987) state that physical exercises relieve the premenstrual syndrome. These authors believe that physical exercises may have a remedial effect in case of a premenstrual syndrome. We should point out that this statement refers to non-intensive physical exercises.

Lebrun CM. (1993) studied the effect of the different phases of the menstrual cycle and oral contraceptives on athletic performance. The author found that the women's best performance was immediately after the menstrual cycle. Their practice deteriorated during the premenstrual phase and the first days of the menstrual cycle. Many athletes indicate that premenstrual symptoms like fluid retention, weight gain, mood changes etc. impede their training practice. The author says that these symptoms were connected to musculoskeletal injuries. Leburn noted that it was difficult to interpret the early studies' results as a small number of women were used for this research. Their training intensity varied significantly and the menstrual phases were not clearly determined. We support Leburn's recommendation to carry out trainings in conformity with the menstrual cycle. This will contribute to a maximum effectiveness of the training process.

Wojtys EM et al. (1998) made a research on the interrelation between menstrual phases and injuries. This study is directed at the anterior cruciate ligament injuries in female athletes. It shows that the ovulatory phase of the cycle is the most dangerous time for injuries.

Cockerill IM et al. (1992) made an interesting research on the impact of the high-intensity training and the menstrual cycle on the mood. Forty women were tested. Half of them run from 50 km to 130

km per week. The control group of twenty women do not train and have a regular menstrual cycle. From the group of the female athletes seven are amenorrhoeic and the rest thirteen are eumenorrheic or oligomenorrhoeic.

Profile of Mood States (POMS) questionnaires was used as a method for evaluation. The women have filled out the questionnaire twice to record their premenstrual influences. It was concluded that the premenstrual symptoms have significant negative effect on the mood of the women.

Bennel K et al (1999) reviewed the publications on the influence of contraceptives on female athletes. Decrease of the premenstrual symptoms was stated as one of the benefits from using oral contraceptive pill. Other advantage is the possibility to manipulate the timing of the menstrual cycle in order to avoid the negative influence of the premenstrual symptoms during competitions.

The authors quoted above showed important tendencies of the interrelation between premenstrual syndrome and the sports activity which may be a basis for further researches.

7. Conclusions

There is no extensive research on the influence of the premenstrual syndrome on female athletes.

Our study showed that only a small part of female athletes did not have a premenstrual syndrome.

The most repeated symptoms are nervousness, irritability and frequent change of mood.

A thorough knowledge on the influence of the premenstrual syndrome on female athletes may be useful in modeling the menstrual cycle with the elite female athletes. It is important for the sprinters, jumpers, shooters etc. to neutralize the effect of difficulty concentrating symptom and with athletes who's sports have weight categories – the "weight gain" symptom.

The analysis of the results showed that the increased number of premenstrual symptoms augmented statistically their negative influence on the emotional health of female athletes.

As the knowledge in this field is insufficient it requires further research in this direction which may allow the use of the reserve it has, for better sports achievements.

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