The effects of Taekwondo sports on the onset of menarche in the female athletes & non-athletes in the North area of Khuzestan

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ABSTRACT

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Background: Menstruating women is one of the most important happen in their lives & the age of this happening is one of the most important characteristics in early pregnancy, in the other hands, this characteristic is one of the healthy & determining index of their health & their adolescent health, which seems, included by intense exercises. Objective: The aim of this research is study is surveying on the effects of taekwondo on the onset of menarche in the 15-17 years old female athletes & non-athletes in the North area of Khuzestan. Based on the characteristics of society, the sample of athletes obtained by census & in non-athletes used by available methods, statistical sample included 200 persons (100 athletes & 100 non-athletes). After coordination & distribution of questionnaire, they will fill them & measured their height & weight. For analyzing the data was used deductive & descriptive methods & also statistical test of variance analyzing & dependent t-test in the $P \leq 0.005$ meaningful level. Results: The mean of age onset of menarche (menstrual period) in female taekwondo players & non-athletes were 13.5 years old $\pm$ 0.94, 13.93 $\pm$ 0.65, 13.07 years old $\pm$ 0.99. So, the Taekwondo players menstruate, averagely about 0.86 years later than non-athlete that these differences were significant ($p=0.001$). There is different significant relationship between the age of start taekwondo & the age onset of menarche ($p=0.001$, $r=0.368$). Conclusion: It means that Taekwondo players have started earlier, they arrive later menarche.

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INTRODUCTION

Today, it can be seen gradual sustainability growth in women’s participation in competitive & recreational sports & this fact caused to the researchers motivated to do research on women sports. Knowledge of coaches on the problems of female sports is so important problems such as; biomechanics, nutrition, pathology, physiology, menarche & problems of menarche. Using these sciences for enhance the effectiveness of women’s training programs is so important [15].

Today, world & East Asian martial arts are epidemic among youth & children [16]. Also the number of female would be increased in participating the martial arts to increasing physical strength & skills level in self defense [14].

Menstruating women is one of the most important happen in their lives & the age of this happening is one of the most important characteristics in early pregnancy, in the other hands, this characteristic is one of the healthy & determining index of their health & their adolescent health, which seems, included by intense exercises [4].

The steady decline over the past century, about the age of the first menstruation is considered as positive indicator for general health & individual status (Ersoy, 2004). In the other hands, decreased the age onset of menarche influenced on issues, such as; premenstrual syndrome (PMS), dysmenorrhea, amenorrhea, breast & endometrial cancers. [16].

Dale, Gerlach, Martin, Alexsander (1979) & Malina, Harper, Avent & Campbell pointed that the girls who don’t participate in competitions experienced first menstrual so sooner than classmates’ athletes, so there is close relationship between the level of personal activity & age of the first menarche [10]. The research follows to finding the answers following questions:
1- Is there any difference between the onsets of menarche female Taekwondo players & non-athletes in North area of Khuzestan?
2- Are there relationship between earlier Taekwondo exercising & more Taekwondo exercising & more delays in onset of menarche in North area of Khuzestan?

Hormone mechanisms of the menstrual cycle follow that gonadotropin-releasing hormone (Gn-RH) produced in hypothalamus & transported to anterior pituitary & it is essential for production & secretion of FSH & LH. Acted FSH & LH on ovaries is responsible for producing estrogen & progesterone & by acting the mechanism of positive & negative feedback on pituitary helped to the survival of the ovulation cycle. Cut each point of this sequence lead to menstrual dysfunction [20].

![Fig. 1-2: The most important menstrual secretion hormones in the hypothalamus level to ovary](image)

The age of the menarche varies from one community to another community & influenced by some factors such as: genetics, climate, location in terms of geography, exposure, race, socio-economic factors, migration, health, weight, nutrition & mental conditions [21]. The effects of sport on the age onset of menarche are justified by two theories; 
A: Doing extreme exercises in years before puberty delay the sexual performance by decreasing energy or caused to the obtaining essential critical weight or fat content (decreasing energy)
B: Physical characteristics are associated with late onset of puberty (such as, getting a slender body & decreasing fat & long legs) are associated with success in sports (pre-selection) [7].

Early onset of menstruation considered as most important factor of breast cancer risk & metabolism syndrome in adults, in the other hands, there is relationship between early onset of menarche & increasing the pain during menstruation [6].

Considering the most important factors such as genetic factors & body structure & also geographical & climate characteristics & nutrition…

The elite athletes before puberty did extreme activities & nature of these sports are caused to the drastic reduction in fat mass & then caused too the menarche will delayed, not only it is considered as problem but also it considered as score for them in social activities [19].

Increasing the incidence of delayed menarche in athletes is not explained by lower body fat & weight alone. Maybe, it is because of exercise that it is caused to increasing the metabolism rate & for menstrual cycle needs to more inactive fat, so the menarche will be delayed or a menorrhea precedes [2].

**Materials and Methods**

The method of this research is descriptive & it is done by researchers’ made questionnaire. The (statistical) population of this research included 2 groups; one of them are female Taekwondo players & the other is non-athletes & athletes population included them who were 15-17 years old that did Taekwondo in North area of Khuzestan that they did exercises at least 1 years before menarche & now the continues their exercises that they are in at all, 100 persons. Regarding to the extent of geography & being more active in cities are selected the girls from North of Khuzestan. Unfortunately, in some cities such as; Masjed Soleyman, Baghe-e-Malek, Lalish… are not found active girls in these field or in these ages & the data is related to the Andimeshek, Dezful, Shushtar, Gotvand, Shush & Izech. Also the population of non-athletes included 15-17 years old of girls who live in North area of Khuzestan & they didn’t participate in any kinds of sports. Regarding to the limited athletes population, the statistical sample of this group selected by census & the population is considered 100 persons that 100 non-athletes persons were selected by available method. The sample included 200 persons that during
the questionnaires distribution were measured their weight & high. The measuring tools were questionnaire that made by researcher & this questionnaire divided in to the 2 parts:

The first part included personal information without name & included 8 questions & second part included 14 questions that they related to the menstrual status. This questionnaire is confirmed by some professors of ShahidChamran University & Ahwaz Medical Sciences. The part of personal information such as; age, high, weight, BMI, number of family &… menstrual questionnaire included age onset of exercise (1), the number of hours of sport (2-3-4) & the age of onset of menarche (5) & the question about menstrual statues (menses, daily performance, menstrual distress) menstrual characteristics’ & sports performance (retire from sport-time of withdrawing-changes in athletic performance-continuing operations)

The measuring tools:
1- The weights were measuring by portable Soehnle scale was made by Germany with least dress & without shoes with 0.1kg precision.
2- Measuring the high by stadiometere on the flat place while fused legs, open arms around the body and the knees, hips, shoulders and head straight back to a place along the tangent to the vertex resolution rule was measured 0.5.
3- Body mass index calculated by division weight (Kg) on square of high (meter)

It would be coordinated with coaches after doing coordination with youth & sport Bureau in cities that had 15-17 years old female taekwondo players & then I presented there to measuring their weight & high & then for filling the questionnaires.

Before questionnaire distribution found a proper place for scale &stadiometer& explained the method of filling questionnaire by interviewing. For analyzing the data used descriptive methods & deductive independent t-test & variance analyzing & for measuring frequency, mean, standard deviation & drawing diagrams were used descriptive methods & for measuring the hypothesis was used variance analysis test & independent t-test & is considered meaningful level (P<0.05)
The above statistical methods were done by SPSS software version 18.

Results:
The mean age of start Taekwondo sport was 10.74. These athletes who did Taekwondo, the mean is 4.73 years professionally & exercise 3.25 sessions in each week. 41 percent of them experienced menarche in 13-14 years old. The second scores are related to the 12-13 years old that they were 31 percent of total of them. The ratio of regular to irregular menses in athletes is more than non-athletes.84 percent of Taekwondo players continue to their exercises in menarche (menstrual) time. Most of them stop to exercises when they become menstruate for 1 day & some of them do this because of pain & physical weakness body. The second scores of reasons of withdrawing the exercise was because of worried about the bad effects of exercising on menstrual status. The mean age of onset of menarche was 13.5 +/-0.94 in all samples, it was 13.93 +/- 0.65 in female Taekwondo players & it was 13.7+/- 0.99 in non-athletes (p=0.001)

<table>
<thead>
<tr>
<th>Variance analysis</th>
<th>Total of squares</th>
<th>Freedom rate</th>
<th>Mean square</th>
<th>F</th>
<th>Meaningful level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal group</td>
<td>36.980</td>
<td>1</td>
<td>36.980</td>
<td>51.922</td>
<td>0.001</td>
</tr>
<tr>
<td>Inner group</td>
<td>141.020</td>
<td>198</td>
<td>0.712</td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>178.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Statistical t-test on age onset of menarche in Taekwondo athletes & non-athletes.

<table>
<thead>
<tr>
<th>t-test</th>
<th>mean</th>
<th>t</th>
<th>Freedom rate</th>
<th>Mean difference</th>
<th>SD difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taekwondo athletes</td>
<td>3.9300</td>
<td>7.206</td>
<td>199</td>
<td>0.001</td>
<td>0.86000</td>
</tr>
<tr>
<td>Non-athletes</td>
<td>3.0700</td>
<td></td>
<td></td>
<td></td>
<td>0.11935</td>
</tr>
</tbody>
</table>

There is meaningful relationship between Taekwondo sport & the age onset of menarche (r=0.368, p=0.001) it means that Sport taekwondo has started early, they arrive to menarche later.

Table 3: Pearson correlation on age onset of menarche & its relationship to the age of starting Taekwondo.

<table>
<thead>
<tr>
<th>Statistical index</th>
<th>The age onset taekwondo</th>
<th>The age onset of menarche</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson correlation</td>
<td>1</td>
<td>0.368*</td>
</tr>
<tr>
<td>Meaningful level</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Sample numbers</td>
<td>100</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Based on reported scores in table & this diagram showed that doing taekwondo has started in younger ages, they arrive to menarche later.
The mean of age onset of menarche is 13.93 in the taekwondo players group that it is more than non-athletes group.

The girls who do taekwondo in the younger age, they menstruate later.

Discussion:
In the girls who exercise regularly the age of onset of menstrual cycle has little delay. Since, early onset of menstruation is one of the reasons of breast cancer & sports help it by delaying the risk of it. Also excessive obesity in adolescence & puberty is one of the reasons of breast cancer in menopause & sports & exercises provide to suffer from it by keeping balance weight & also caused to bone density (BMD) & provide osteoporosis in postmenopausal. Regarding to the female ability in unnecessary fat storage, sport can keep balance weight & cardiac–vascular disease & insurance their health [18].

The most important subject is comparison between age onset of menarche among Taekwondo players & non-athletes. The results of research showed that the mean of sample 13.5 +/- 0.94 age onset of menarche, when the age onset of it was 13.93 +/- 0.65 & it was 13.07 +/- 0.99 among non-athletes. Averagely, female Taekwondo players menstruate 0.86 years later than non-athletes. Statistical tests had confirmed meaningful difference among two groups. So we resulted that Taekwondo caused to delaying the age onset of menarche.

The results of this research are same as [7, 1, 3, 21, 23, 8, 12, 22, 6, 10] & it is not same as [13] & this difference is because of difference between intense & activities such as different genetics, geography, culture & …

Some of evidences showed that “the age of menarche relates to the years of exercising before onset of menarche” [3], Frisch hypothesis says that for each years of exercising before menstruation, the onset of menarche will be delayed 5 months [23].

The results of this research show that there is meaningful relationship between the age onset of Taekwondo & the age onset of menarche in North area of Khuzestan & it means that if female has started early, they arrive to menarche later.
The result of recent research is same as the results of [7] & this different is because of the effects of light & small sports in different age onset of menarche. The extreme exercises before the puberty, caused to decrease the energy & then caused to delay the sexual performance or provided to obtaining the critical weight or fat (decreasing energy), also body characteristics are along with late onset of puberty (such as habit of get skinny, decreasing the fat & long legs) & are related to the sport (preselecting) that it is shown the notice of hormones success in athletes [3].

REFERENCES