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Exercise – Induced Bronchospasm in Soccer Players

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ABSTRACT

Background: *Exercise is one of the most prevalent predisposing factors of bronchospasm. Its symptoms may be merely due to physical activities. Clear understanding of exercise-induced bronchospasm is essential to eliminate complications and achieve more effective treatment.*

Materials and Methods: *The study population consisted of Tehran soccer-players. In this clinical trial, four soccer clubs were selected by cluster random sampling. The means of data collecting included history taking, physical examination, and the performance of spirometry tests at rests as well as 5 and 12 minutes after exercise.*

Results: *One hundred soccer players were enrolled in this study with the mean age (±SD) of 20± 4.26 years old. The mean values of FEV1±SD measured at 5 minutes before as well as 5 and 12 minutes after a ten-minute continuos exercise were 4.15± 0.44, 4.13 ± 0.5, and 4.12 ± 0.49 liter respectively. These differences seem to be age related.12 minutes after exercise, 6 players have shown reduced FEV1 (15-17%) in respect of resting value (4.78 ± 0.52 vs. 3.57 ± 0.33).*

Conclusion: *The prevalence of exercise-induced bronchospasm was 6% in our study, comparable to 3-11% reported of others. The lower prevalence of exercise- induced bronchospasm in our study may be due to older study group, negative history of allergy and pulmonary diseases in our cases.* ***(Tanaffos 2002; 1(2): 35-39)***

Key words: *Exercise-induced bronchospasm, Soccer player, FEV1*

INTRODUCTION

Asthma is a very common disease, and exercise-induced bronchospasm due to maximal physical activities, inhalation of cold and dry air can not be differentiated from asthma. It is known that one of the most common predisposing factors for asthma attack is exercise. Sometimes the only cause of asthmatic symptoms in mild asthma is exercise (1).

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Providing athletes with desired facilities to find their right socioeconomic and political situation in the society is of utmost importance. To meet this demand, researchers should be encouraged to conduct studies so that better understanding of disease could be achieved in hope to decrease psychological and physical complications and provide better therapeutic approaches. As a matter of fact, these studies were performed following the accusation of one of the Olympic champions for

doping after he was awarded a gold medal in 1972, while he had only used antihistaminic drugs (2). Later on these studies showed that 10% of the Olympic athletes in Australia had either asthma or allergic rhinitis. Other studies revealed the prevalence of exercise-induced bronchospasm in 90% of asthmatic and of 40% allergic rhinitis patients (3,4). It is important to understand that the effects of individual and environmental factors such as: exercise intensity (5,6) and it's length, the nature of exercise (7), inhalation of cold and dry air (8,9,10), and also provocative effect of substances in the environment on developing exercise-induced bronchospasm. Keeping these facts in mind could help provide better condition for athletes with asthma considering the use of effective prophylactic and therapeutic procedures without being accused of doping. These, in turn, could raise up their morals and keep them on better health condition. Therefore, the present study was conducted to evaluate the effect of exercise on bronchospasm in the premier league soccer players of Tehran, in 1998.

MATERIALS AND METHODS

This clinical trial was performed on premier league soccer players, who were involved in maximal and regular activity with pre-determined place and time of exercise. SAIPA, PASS, PIROOZI, and BANK MELLI teams were selected by random cluster sampling. All soccer players in these four clubs included 100 athletes participated in the study. The history of asthma and allergic rhinitis were considered as exclusion criteria (4); however, none of these players suffered from asthmatic symptoms nor allergic rhinitis. This study was performed during the period of league from July to December 1998. The temperature ranged 20^0C- 37^0C, and the humidity was between 18-51% in the period of the study.

Initially each player was given a special code, then history was taken including their occupations, history of pulmonary or allergic disease, and smoking habit. Physical exam was performed and data were recorded. Spirometry test (using Germany Dimeq spirometer) was performed 5 minutes prior to exercise (at rest), as well as 5 and 12 minutes following ten-minute continuous exercise (1,11). Simultaneously, symptoms such as cough, shortness of breathing, wheezing and discomfort in the chest along with physical exam were evaluated at each stage and the results were recorded.

The diagnostic standard for exercise-induced bronchospasm was considered as a 15% decline in FEV1 (1). The FEV1 changes were considered as dependent variables for exercise-induced bronchospasm (independent variable). A paired t-test was used to compare prior and post exercise spirometry data.

RESULTS

In this study, 100 male soccer players of Tehran's premier league clubs were included. Their mean age (±SD) was 20 ± 4.26 years, ranging from 16 to 35 years. The mean of weight and height were 68 ± 6.6 kg and 176.1±6.5cm, respectively. The mean duration of sport activities was 5.4 years.

The prevalence of exercise-induced bronchospasm was reported 6%, where a 15-17% decline in FEV1 was found in the affected individuals. The mean FEV1 five minutes prior to exercise as well as 5 and 12 minutes after ten- minute continuous exercise was 4.15±0.44, 4.13 ± 0.45, and 4.12±0.46 liter, respectively. The t-test has revealed no statistically significant difference. FEV1 of 4 ± 0.25 liter was reported in the 43% of the study population, however, 9% have shown FEV1 of 3.25 ± 0.25 liter. Variation in FEV1 seems to be age related. Players aged 21-25 years old have shown greater variation in FEV1; however, this difference was revealed not to be significant.

There was a decline in FEV1 with increasing age, but no significant difference existed according to

ANOVA test. Except for a small group (6 out of 100), showed 15% decline in FEV1 following the exercise, the remaining have shown no decrease, and on the contrary, even some degree of increase was noted in FEV1 value.

DISCUSSION

High prevalence of exercise-induced bronchospasm as found in our study, brings up plenty of physical and psychological problems for the involved athletes. These seek special attention for better diagnosis and treatment. Exercise-induced bronchospasm is a very common complaint in children (12). It was reported in 12% of high school athletes in the USA (13).

11.4% of athletes participating in L.A. Olympic 1984,complained of exercise-induced bronchospasm, of whom 4.4% did have the diagnosis of asthma (2). This problem was reported in 7.1% of the Swiss athletes, 3.7% of whom, had the diagnosis of asthma. Furthermore, Katz RM stated the prevalence of 9% in Australia Olympic (3).

This high rate may be partly due to younger age of this athletic population. The other study guided in Washington University (1979-81) announced the prevalence of 2.8% for this problem (8,14).

In our study, the prevalence of exercise-induced bronchospasm was 6% comparable to 3-11% reported in other studies (15). There was no significant difference in FEV1 in the present study. This may be due to higher mean age, and lack of allergy or other predisposing factors in the study population. However significant association between exercise-induced bronchospasm and predisposing factors are noted in other studies.

As stated, the prevalence of exercise-induced bronchospasm in children with seasonal, persistent or chronic asthma were 23.4%, 33.3%, and 75% respectively (16).

Prior investigators believed that only with history and spirometry tests we are unable to diagnose all exercise-induced bronchospasm. In a study performed by November et al. 10.3% developed exercise-induced asthma without previous history of asthma (16). Rupp et al. showed that 6.4% of exercise-induced asthma revealed no abnormality in spirometry (13). Since antihistaminic drugs are not considered as doping agents and there is no legal restriction for their prescription, having the asthmatic athletes found and giving there special care could be a valuable help for athlete society. Of course, there is much more need for further study in this subject.

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