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A Study on Fungal Infection Athlete's Foot among Soccer Players in the Esfahan City Sport Clubs

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The objective of this study is to investigate the prevalence and risk factors for tinea pedis in soccer players. This study was done in summer 2002 on 180 soccer players of the 8 first league clubs of Esfahan. Samples were collected from two forth-interdigital toe web spaces and cultured on Scc agar medium and incubated for 3 weeks. The results showed that a bout 3.33% (n = 6) of players were positive in 3 out of 8 teams. Trichophyton rubrum had a most frequency (4 cases). Trichophyton mentagrophytes and Epidermophyton floccosum isolated from 2 cases. Besides, some factors include exercise hours, kind of stockings and shoes, amount of foot perspiration and route of showering detected by questionnaire. There were not any significant differences between these factors and frequency of infection ($p > 0.05$). However significant relation was observed between different clubs and the frequency of infection in players ($\chi^2 = 0.035$).

Key words: Dermatophytosis, tinea pedis, soccer players, Iran

INTRODUCTION

Tinea pedis is a fungal infection of the skin between toes sometimes spreading to other areas of the foot. This infectious disease is produced by Dermatophytic fungi such as *Trichophyton* sp. and *Epidermophyton floccosum* (Perea *et al.*, 2000).

Repeated exposure, macerating conditions due to ill-fitting shoes and sweaty socks and possibly genetic factors are suggested as the most likely predisposing conditions for the disease (Rippon, 1988).

Athletes have the chance to acquire dermatological lesions including those of fungal etiology. The athlete's synthetic clothing and shoes retain sweat, favoring fungal development. During soccer practice, feet are subjected to intense battering, that may predispose to the development of mycoses (Adams, 2002; Bukhart, 1999).

This study evaluates the frequency and risk factors for tinea pedis among soccer players.

MATERIALS AND METHODS

This study was done in summer 2002 on 180 soccer players of the 8 first league clubs of Esfahan. In order to assess the prevalence of subclinical infection, sampling was done in fourth interdigitate space of both feet. Some scales of these areas were scraped by sterile scalpel blade and sent to the laboratory in sterile plates. Gathered samples (360 ones) were cultured on the Sabouraud-Dextrose agar media in the presence of chloramphenicol

(0.05 g L⁻¹) and cycloheximide (0.5 g L⁻¹) and maintained at 25 degrees centigrade for three weeks. After incubation period the grown fungi were identified via the colony form and the characters of fungus after staining with lactophenol cotton blue dye.

The needed epidemiological informations were collected by questionnaire and ultimately data were analyzed using descriptive statistics and Chi-square (χ^2) test.

RESULTS

Out of 180 sampled players, six ones were positive and contaminated with dermatophytic fungi isolated on SD Agar media. The most prevalent fungus was *Trichophyton rubrum* (4 cases). Also one case from each of *Trichophyton mentagrophytes* and *Epidermophyton Floccosum* species was observed. Five of the infected players had on pruritus or scaling. This result shows that 2.7% of study subjects had occult tinea pedis.

In this survey no significant correlation was observed between exercise hours, kind of stockings and shoes, amount of foot perspiration and route of showering with the tinea pedis prevalence rate (Table 1).

The positive subjects all were from three of eight studied teams and in the five remaining teams no positive subject was seen (Table 2). The results of the Chi-square test demonstrated that correlation between the club and the frequency of positive cases is statistically significant (p<0.05).

Table 1: The correlation between exercise hours, kind of stockings and shoes, amount of foot perspiration and route of showering with tinea pedis prevalence rate

Instances		Uninfected	Infected	Total	Conclusion
Exercise hours	<2 h	46	1	47	p<0.05 df=2 $\chi^2=0.664$
	2-5 h	115	5	120	
	>5 h	12	-	12	
	Total	173	6	179	
Kind of stockings	Cotton	95	2	97	p<0.05 df= 2 $\chi^2 = 0.530$
	Nylon	14	1	15	
	Mix	64	3	67	
	Total	173	6	179	
Kind of shoes	Natural leather	80	2	82	p<0.05 df= 1 $\chi^2 = 0.782$
	Industrial leader	93	3	96	
	Total	173	5	178	
Amount of foot perspiration	High	69	2	71	p<0.05 df= 2 $\chi^2 = 0.854$
	Medium	100	4	104	
	Low	5	-	5	
	Total	174	6	180	
Route of showering	No showering	12	-	12	p<0.05 df= 2 $\chi^2 = 0.781$
	At home	140	5	145	
	In gymnasium	22	1	23	
	Total	174	6	180	

Table 2: The correlation between the club and the frequency of positive cases

Sport clubs instances	A	B	C	D	E	F	G	H	Total
Uninfected	27	16	21	18	23	27	24	18	174
Infected	1	2	-	3	-	-	-	-	6
Total	28	18	21	21	23	27	24	18	180

Conclusion p<0.05 df= 7 $\chi^2 = 0.035$

DISCUSSION

The result say that in some sport clubs the dermatophyte infection is endemic. The most prevalent fungus found in this research was *Trichophyton rebrum* (66.6% of all isolated fungi). This is in contrast to other researchers' findings in Iran. Chadeganipour *et al.* (1997) in their study on general population of Esfahan found that *Trichophyton verrucosum* is the most frequent one (32.8%). Also Mahmoudabadi (2005) in his survey on the people of south west of Iran found *Trichophyton mentagrophytes* as the most prevalent one.

However this study results are in accordance with Djeridane *et al.* (2006), Perea *et al.* (2000) and Hapcioglu *et al.* (2006) survey. The prevalence rate of contamination resulted from our study is accounted a low rate comparing other researchers' results.

Cohen *et al.* (2006) reported the mycological prevalence rate of tinea pedis among 223 Israeli soldiers to be 27.3%. Also Rosseuw (1999) determined the rate 22%, 15% (Djeridane *et al.*, 2006), in South-African muslims 85% (Raboobee *et al.*, 1998), in Turkey worshipers 29.5% (Ilkit *et al.*, 2005) and 15% (Hart *et al.*, 1999).

It's suggested that the low rate of this study is due to differences in study region, population, climate and better hygienic behaviors of study subjects. Because Esfahan is regionally warm and dry and at the other hand most to all of subjects (93.3%) were taking showers after exercise.

Also in Purium *et al.* (2005) study, the frequency of tinea pedis among soccer players was lower than the other groups. He supposed that health education and professional feet care were the most important factors for the lower incidence in soccer players.

Statistical analysis shows that factors other than exercise site and club do not affect the disease incidence. So, education of athletes about this kind of disease, hygienic behaviors and timely treatment of infection with drags such as clotrimazole is very effective in reducing disease prevalence rate.

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