

Dermatophytes contamination of wrestling mats in sport centers of Isfahan, Iran

Sir,

Dermatophytes are fungi causing one of the most common infections in the medicine. These pathogens will spread through two ways: direct contact with other people, animals, and soil; or indirectly from fomites.^[1,2] Direct contact during exercise or competitions with infected athletes or contaminated equipments is the reason of being infected by *Tinea gladiatorum* (dermatophytosis or ringworm in wrestlers).^[3] Prevalence of dermatophytes in wrestlers is reported in a wide range of 20%-77%.^[4,5] Some studies have reported that wrestling mats will be a source for the fungal infections as it is reported that 44% wrestling mats were contaminated.^[6,7] We aimed to assess the prevalence of wrestling mats contamination with dermatophytes in the sport centers of Isfahan city of Iran.

To achieve this aim a cross-sectional study was conducted. All the sport centers in Isfahan city that had the wrestling club were enrolled into this study. Demographic of the club including air conditioning, temperature, and exercise time per day were obtained from the directors. Also history of any fungal infections during the previous month was obtained. For each club, three samples from two wrestling mats (six samples for each club) were taken. To collect the samples, 2.5 × 2.5 sterile carpet pieces were used. The differentiation of dermatophytes was carried out based on colony morphology on mycosel agar and on their microscopical appearance. Statistical analysis was done using SPSS version 16. Descriptive analysis and Chi-square test were used to describe and compare the distributions, respectively. Statistical significance was assessed at the 0.05 probability level in all the analyses.

In this study, seven wrestling clubs were included. Temperature of all the clubs was lower than 25°C and 1.5 h was the exercise time during a day for all of them. Table 1 shows the result of culturing and dermatophytes determination. As table 1 is reporting, only two dermatophytes of *Trichophyton rubrum* and *Trichophyton mentagrophytes* were detected in wrestling mats in Isfahan. Of the 14 mats, eight (57.1%) of them and of the clubs, six (85.7%) clubs had at least one positive result for dermatophytes

Table 1: Dermatophytes detected from samples of different wrestling clubs mats of Isfahan, Iran

Clubs	Plate 1	Plate 2	Plate 3
A-1	Neg	Neg	<i>T. rubrum</i>
A-2	Neg	Neg	Neg
B-1	Neg	Neg	Neg
B-2	<i>T. rubrum</i>	Neg	Neg
C-1	Neg	Neg	Neg
C-2	Neg	Neg	Neg
D-1	<i>T. rubrum</i>	Neg	<i>T. rubrum</i>
D-2	Neg	Neg	Neg
E-1	<i>T. rubrum</i>	Neg	<i>T. rubrum</i>
E-2	<i>T. rubrum</i>	<i>T. rubrum</i>	Neg
F-1	Neg	Neg	<i>T. rubrum</i>
F-2	<i>T. rubrum</i>	<i>T. rubrum</i>	Neg
G-1	Neg	<i>T. menta</i>	<i>T. menta</i>
G-2	Neg	Neg	Neg

A-1 and A-2 mean mats 1 and 2 in club A; Neg: Negative;

T. rubrum: *Trichophyton rubrum*, *T. menta*: *Trichophyton mentagrophytes*

contamination. Of all the 21 samples, 13 (61.9%) were contaminated (52.4% and 9.5% were *T. rubrum* and *T. mentagrophytes*, respectively). Our data showed negative results for one of the clubs (club C). In clubs A, B, D, E, and F, *T. rubrum* (71.4% of all clubs) and in club G, *T. mentagrophytes* (14.2% of all clubs) were detected. Of the seven clubs, five (clubs A, B, C, E, and G) had air conditioning and two of them (clubs D and F) had not, and there was no significant difference in the type of dermatophytes between clubs with and without air conditioning ($P = 0.571$). Also one club (club D) had positive history of fungal infection during last month. There was no significant difference between distribution of type of dermatophytes in clubs with and without a positive history of fungal infection during the previous month ($P = 0.792$). Habibipour *et al.*, in their study in Hamadan city of Iran, reported that a mat (10%) was infected with dermatophytes. Dermatophyte that was isolated from wrestling mats was *Trichophyton tonsurans*.^[8] Another study by Aghamirian *et al.* revealed that of 24 wrestling mats that were surveyed, 33.3% were heavily contaminated with *T. tonsurans* (the only dermatophyte detected in mats).^[9] Ahmadinejad *et al.* have reported that 44% of wrestling mats were contaminated with different fungal organisms, including *Epidermophyton floccosum*, *T. mentagrophytes*, and *T. rubrum*.^[10] Kohl *et al.*

determined that it is unlikely that wrestling mats be a source of dermatophyte infections in wrestlers. In Kohl *et al.*'s study, none of the mat samples produced any dermatophyte growth.^[7] Hedayati *et al.* in a study from Sari, Iran, showed that all the wrestling mat samples were positive for *T. tonsurans* and have suggested that contamination of wrestling mats with dermatophytes has a crucial role in the infection of wrestlers.^[10] Some other studies have suggested that transmission of *T. gladiatorum* occurs only by skin-to-skin contact and not by contact with contaminated wrestling mats.^[11,12] According to previous studies and also our results, wrestling mats will be contaminated with dermatophytes and can be potentially a source for transmission of ringworm diseases.

As *T. gladiatorum* in Iran is a common phenomenon among wrestlers and this infection can disqualify the athletes from matches and exercise; appropriate preventive programs must be designed to reduce the incidence of fungal skin infection and transmission among wrestlers. This aim will be reached by finding the sources and disinfecting them.

Shahla Shadzi, Behrooz Ataei¹, Zary Nokhodian,
Dana Daneshmand²

Infectious Diseases and Tropical Medicine Research Center,
¹Acquired Immunodeficiency Research Center, ²Nosocomial
Infection Research Center, Isfahan University of Medical Sciences,
Isfahan, Iran

Address for correspondence: Mr. Dana Daneshmand,
Nosocomial Infection Research Center, Isfahan University
of Medical Sciences, Isfahan, Iran.
E-mail: daneshmand.dana@gmail.com

REFERENCES

1. Hainer BL. Dermatophyte infections. *Am Fam Physician* 2003;67:101-8.
2. Odom R. Pathophysiology of dermatophyte infections. *J Am Acad Dermatol* 1993;28:S2-7.
3. Dienst WL Jr, Dightman L, Dworkin MS, Thompson RK, Howe WB. Pinning down skin infections: Diagnosis, treatment, and prevention in wrestlers. *Phys Sportsmed* 1997;25:45-56.
4. Adams BB. Transmission of cutaneous infections in athletes. *Br J Sports Med* 2000;34:413-4.
5. Adams BB. Dermatologic disorders of the athlete. *Sports Med* 2002;32:309-21.
6. Ahmadinejad Z, Razaghi A, Noori A, Hashemi SJ, Asghari R, Ziaee V. Prevalence of fungal skin infections in Iranian wrestlers. *Asian J Sports Med* 2013;4:29-33.
7. Kohl TD, Martin DC, Nemeth R, Evans DL. Wrestling mats: Are they a source of ringworm infections? *J Athl Train* 2000; 35:427-30.
8. Habibipour R, Moradi-Haghighi L, Bayat S. Survey on dermatophytosis in wrestlers and its relationship with wrestling mats in Hamedan. *Zah J Res Med Sci* 2012;14:38-42.
9. Aghamirian MR, Ghiasian SA. A clinico-epidemiological study on tinea gladiatorum in Iranian wrestlers and mat contamination by dermatophytes. *Mycoses* 2011;54:248-53.
10. Hedayati MT, Afshar P, Shokohi T, Aghili R. A study on tinea gladiatorum in young wrestlers and dermatophyte contamination of wrestling mats from Sari, Iran. *Br J Sports Med* 2007;41:332-4.
11. Frisk A, Heilborn H, Melén B. Epidemic occurrence of trichophytosis among wrestlers. *Acta Derm Venereol* 1966;46:453-6.
12. Beller M, Gessner BD. An outbreak of tinea corporis gladiatorum on a high school wrestling team. *J Am Acad Dermatol* 1994;31: 197-201.

Access this article online

Quick Response Code:	Website: www.advbiores.net
	DOI: 10.4103/2277-9175.145747