

SHORT REPORT

A study on tinea gladiatorum in young wrestlers and dermatophyte contamination of wrestling mats from Sari, Iran

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Br J Sports Med 2007;41:332–334. doi: 10.1136/bjsm.2006.030718

Objective: To study the prevalence of tinea gladiatorum among young wrestlers and dermatophyte contamination of wrestling mats from Sari city, the capital of Mazandaran, a northern province of Iran.

Design: 324 wrestlers (aged 9–20 years) from 7 active clubs in Sari city were examined, and skin scrapings were obtained from 135 wrestlers suspected of having tinea gladiatorum. The scraped skin samples were evaluated with potassium hydroxide. Pleated carpet sterile fragments (5×5 cm) were used for to survey of wrestling mat contamination. Sabouraud's dextrose agar with and without chloramphenicol and cyclohexamide was used to culture scrapings and wrestling mat samples. The dermatophytes were identified by routine laboratory techniques.

Results: Our study showed that of the 324 wrestlers, 65 (20.1%) had tinea gladiatorum. Most lesions were on the trunk and head. All the wrestling mat samples were positive for dermatophytes. *Trichophyton tonsurans* was isolated from all the scrapings and wrestling mat samples.

Conclusion: Considering that several colonies of *T tonsurans* were isolated from all the wrestling mats and from wrestlers with tinea gladiatorum (as the only dermatophyte species) we think that the contamination of wrestling mats with *T tonsurans* has a crucial role in the infection of wrestlers.

Tinea gladiatorum is a superficial dermatophytosis infection that is transmitted mainly through skin-to-skin contact among wrestlers. Several studies from around the world report the prevalence rates for tinea gladiatorum,¹ ranging from 20% in a Hungarian wrestling team² to 44.1% from Lanzarote in the Canary Islands.³ Most studies that examined the prevalence of tinea gladiatorum were associated with an outbreak, such as in an Alaskan high-school team in 1992–3 when 75% of the wrestlers had tinea gladiatorum.⁴ Adams⁵ showed a prevalence of 24% in a Cincinnati high-school team without a known epidemic.

Outbreaks of tinea gladiatorum due to *Trichophyton tonsurans*, an anthropophilic microorganism, have been reported,^{3–9} but it seems that *T tonsurans* and *T rubrum* are the most prevalent agents of tinea gladiatorum.¹⁰ Dermatophytes have been difficult to culture from wrestling mats, but, in two studies in France⁸ and Sweden,¹¹ *T tonsurans* was isolated.

Wrestling is a common sport among young people in Sari city, the capital of Mazandaran, a northern province of Iran. Sari city is located next to the Caspian Sea, and it has a temperate climate with high humidity. This condition can be an important predisposing factor for skin infection; so, for the first time, we studied the prevalence of tinea gladiatorum among young wrestlers and dermatophyte contamination of wrestling mats from Sari city.

MATERIALS AND METHODS

From November to March 2005, we examined 324 wrestlers (aged 9–20 years, mean 13.8 years) from seven active clubs in Sari city. All wrestlers were systematically examined, and skin scrapings were obtained from 135 wrestlers who had suspected tinea gladiatorum lesions. Microscopic examination of scraped skin samples was performed using 20% potassium hydroxide.

A total of 81 pleated carpet sterile fragments (5×5 cm; nine for each mat) were used to survey the wrestling mat contamination. One of the clubs had three mats. Sabouraud's dextrose agar with and without chloramphenicol and cyclohexamide were used to culture scrapings and wrestling mat samples. Cultures were incubated at 30°C for 4 weeks. Cultured dermatophyte colonies were identified by their microscopic and macroscopic characteristics.

RESULTS

Of the 324 wrestlers, 135 had suspected tinea gladiatorum lesions. Each of these wrestlers presented 1–14 (mean 1.9) lesions on different sites of the skin. Suspected lesions were seen most frequently on the trunk (40.7%) and least frequently on hands and feet (1.5%).

Of the 324 wrestlers, 65 (20.1%) had tinea gladiatorum. The distribution of lesions on the body was as follows: 36 on the back, 23 on the scalp, 22 on the arm, 17 on the forearm, 17 on the anterior trunk, 14 on the face, 11 on the feet, 9 on the lower leg, 2 on the groin and 1 on the nail. The mean number of lesions was 2.3 per person (range 1–5).

T tonsurans was grown from all the scrapings of tinea gladiatorum samples as the only dermatophyte species.

Wrestlers had 3–14 (mean 3) practice sessions in a week. They also had from 1 to 7 years (mean 3 years) of experience in wrestling. In all, 95.5% of the wrestlers had a shower in their homes after any practice.

T tonsurans was the only dermatophyte species grown from wrestling mat samples. Of 81 collected pleated carpet samples, 45 (55.5%) were positive for the growth of *T tonsurans* colonies on SCC; 1–10 (mean 4.9) *T tonsurans* colonies were isolated from each wrestling mat. All wrestling mat samples grew *T tonsurans*.

DISCUSSION

Tinea gladiatorum, also known as trichophytosis gladiatorum, is extremely common in wrestling and other sports with close skin-to-skin contact during practice and competition. On the basis of the National Collegiate Athletic Association (NCAA) injury surveillance system, of the skin infections reported from 1991 to 2003, tinea is the second most common skin infection in wrestlers (after herpes).¹² Although it is a fairly benign infection, it has major effects on the ability of a wrestler to compete. In this study, we considered the prevalence of tinea gladiatorum in young wrestlers from Sari city.

What is already known on this topic

- The prevalence of tinea gladiatorum surveyed in some studies ranged from 20% to 75%.
- Most of the information about tinea gladiatorum comes from outbreaks, and little is known about its prevalence in wrestlers.
- In these studies, the diagnosis of tinea corporis is confirmed by using potassium hydroxide.
- Tinea gladiatorum is the second most common skin infection in wrestlers after herpes.
- Although it is a fairly benign infection, it has major effects on the ability of a wrestler to compete.
- The transmission of tinea gladiatorum seems to be by skin-to-skin contact.

What this study adds

- Our study provides some epidemiological data for tinea gladiatorum in Sari, a northern city of Iran, located next to the Caspian Sea where wrestling is a common sport among young people.
- We isolated many colonies of *Trichophyton tonsurans* from all sampled wrestling mats and from wrestlers with tinea gladiatorum as the only dermatophyte species.
- Therefore, we proposed that the contamination of wrestling mats with *T tonsurans* can play an important role in the spread of tinea gladiatorum among wrestlers.

Our study showed that 20.1% of young wrestlers had tinea gladiatorum. This result is concordant with other studies from different countries, where the prevalence of tinea gladiatorum was 20–40.1%.^{2–3} However, many reports that showed that >75% of the wrestlers had tinea gladiatorum.^{3–9} As the frequency of tinea gladiatorum was not previously known in Mazandaran province, so the data of our study may indicate an outbreak.

Lesions in wrestlers are usually found on the head, neck and upper extremities, less often on the trunk and occasionally on the legs.^{9–13} However, on the basis of our study, most tinea gladiatorum lesions appeared on the trunk and head. It seems that the position of wrestler during competition and practice, and contamination of wrestling mats with dermatophytes, are important factors that cause tinea gladiatorum on head and trunk. Wrestlers spend much time during practice and competition in the upright, “lock-up” position. With the wrestler’s heads adjacent to each other, the cheeks are in contact with the competitor’s, and their heads contact each other’s shoulders and necks. This indicates that in the free style of wrestling (the most common form of wrestling in Sari city), the wrestler’s trunk has many contacts with mat in both practice and competition.

The delay that we identified between the end of practice and having a shower may be an interesting risk factor. It can allow deeper colonisation of the skin by the fungus through small wounds that are usually self-healing.

Interestingly, in this study we isolated *T tonsurans* from scrapings of tinea gladiatorum samples as the only dermatophyte species, as in several previous studies.^{6–9–11} It is not clear why wrestlers tend to be infected with *T tonsurans*, but several

authors have suggested that some wrestlers may be asymptomatic carriers.^{8–13}

Dermatophytes are difficult to culture from wrestling mats, but in this study we isolated *T tonsurans* from wrestling mats similar to studies by Poisson *et al*⁸ and Hradil *et al*.¹¹ In contrast to the mentioned studies, we isolated *T tonsurans* from all the wrestling mats, and the burden of contamination in our study was high.

Considering that the isolation of several colonies of *T tonsurans* (as the only dermatophyte species) were isolated from all the wrestling mats and from wrestlers with tinea gladiatorum, we think that the contamination of wrestling mats with *T tonsurans* has a crucial role in the infection of wrestlers. However, epidemiology and microbiology suggest that person-to-person contact is the main source and that some wrestlers may be asymptomatic carriers.^{4–6} Recently, the practice mats were also statistically suspected by Kohl *et al*¹⁴ of wrestlers.

Most wrestling teams practise in small, closed, poorly ventilated rooms, to get used to the stress that will be inflicted on their bodies during a match and also because the sweat, helps them lose weight. This high-humidity environment, along with the sweating and abrasion on the skin of the athlete during a typical 2–3-h practice session, invites several dermatological problems such as tinea gladiatorum. As tinea gladiatorum can affect the ability of a wrestler from competing in matches, surveillance and disinfections of mats are important to prevent infection among wrestlers.

Rapid identification and treatment of tinea gladiatorum is essential in preventing epidemics in wrestling teams. Because the prevalence of infection/colonisation is high among athletes who are in frequent contact with others, all athletes infected with tinea gladiatorum should be treated, and new athletes should be screened for tinea gladiatorum. The routine disinfection of wrestling mats can prevent the transmission of tinea gladiatorum to wrestlers.

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Competing interests: None declared.

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Accepted 8 November 2006

Published Online First 29 November 2006

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Figure 1 Gavin Davis.