

Four common infectious skin conditions

Tinea corporis, Pityriasis versicolor, Scabies, Larva migrans

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Four dermatological conditions, all with well-established pathogens, will be discussed in this article: tinea corporis (dermatophytic infection), pityriasis versicolor (an asymptomatic infection) caused by the yeast *Pityrosporon orbiculare* and two parasitic infestations, scabies and larva migrans. (SA Fam Pract 2004;46(8): 13-16)

1. Tinea corporis (Ringworm of the body)

Tinea corporis designates a dermatophytic infection of the trunk, face and extremities excluding the hands, feet and groins. The infection is caused by three genera of fungi; *Trichophyton*, *Microsporum* and *Epidermophyton*.

The clinical features are variable, but typical lesions are round, erythematous or scaly, well-delineated patches (Figs 1 - 3).



Fig 1: Tinea corporis. Lesion on the knee. More inflamed edge of the lesion.



Fig 2: Tinea corporis. Again, typical well-defined, raised edge.



Fig 3: Tinea corporis. More severe inflammatory reaction - vesicles.

The margins of the lesions are more inflamed than the centre. This "sparing" of the centre results in an annular or circinate (ringworm) configuration.

The severity of the inflammation depends mainly on the immunogenicity of the infective species. In typical cases, *Trichophyton rubrum*, *Epidermophyton floccosum* and *Trichophyton mentagrophytes* are the most frequent isolates. Zoophilic fungi (*Microsporum canis* predominates in South Africa) induce a more marked inflammatory reaction.

The size of the infective inoculum, site of the body affected and immune status of the host also influence the intensity of the reaction. In immunocompromised patients, the involvement is often more extensive. Infections with *Trichophyton rubrum*, a weak immunogen,

are often very persistent. The lesions are often severely pruritic.

Tinea corporis is often confused with other conditions such as nummular eczema, psoriasis, annular erythemas and the herald patch of pityriasis rosea. The distinguishing features of tinea corporis are a less severe involvement of the centre of the lesion, a more active edge and itching.

The clinical diagnosis can be confirmed by a direct potassium hydroxide preparation of the cutaneous scrapings. A positive result confirms the diagnosis, while a negative one does not always exclude the possibility of a patient having a dermatophytic infection. Performance of a culture helps to reduce the margin of error.

Tinea faciale designates the situation when the lesion is localised on the face. It frequently represents an example of so-called Tinea incognito (steroid-modified tinea). The history is characteristic. Topical corticosteroids are initially used as the lesions are misdiagnosed. Patients are usually satisfied at first, as the steroid diminishes inflammation and itching. The lesions persist, however, and often extend in spite of continuation of steroid applications. The clinical picture of steroid-modified tinea varies. There is often no raised active edge.

Treatment

A large number of topical antifungal preparations are available including

creams, ointments, lotions and sprays. These are mostly azole derivatives (clotrimazole, ketoconazole, econazole, bifonazole). They are usually applied twice daily. The minimum period of topical treatment has not been clearly established. It is generally expected that azoles will clear tinea corporis within 14 days.

Terbinafine, an antifungal compound of the allylamines, may be effective within 7 to 10 days, particularly in the treatment of infections caused by *Trichophyton rubrum*.

When the infection is extensive with multiple sites of involvement or when the patient is immunocompromised, the use of systemic antifungal agents is advised.

The azoles, itraconazole or fluconazole, or terbinafine may be used. Itraconazole, is specifically effective in the treatment of a wide range of human fungal pathogens.

The standard itraconazole dose for the treatment of tinea corporis is 100mg daily for 15 days. However, it has been found that a higher daily dose (200mg) given for a shorter period (7 days) had comparable efficacy to the standard regimen.¹

Fluconazole, 150mg once weekly for 2 - 4 weeks, was found to be equally effective.²

Oral terbinafine is also effective at 250mg daily for one week.³

2. Pityriasis (tinea) versicolor

This condition occurs throughout the world, but with greater frequency in warm climates. It most often affects young adults of both sexes and all races.

Saprophytic *Pityrosporum orbiculare*, a dimorphic and lipophilic yeast, is part of the normal flora of the skin. It only becomes pathogenic under certain conditions. The critical factors for this transformation are not fully known. Heat, high relative humidity, high lipid content of the epidermis, occlusion and increased levels of glucocorticoids play a role. There may also be an inherited predisposition to the disease.

Pityriasis versicolor is a very benign condition. When extensive, however, it can be cosmetically unacceptable to the patient. Its course is chronic and subject to relapse.

The condition consists of multiple hypo- or hyperpigmented, red or yellowish-brown (hence versicolor) macules. The macules are well-defined and have fine, powdery, bran-like (pityriasisform) scales (hence pityriasis). Figs 4 and 5.



Fig 4: Pityriasis versicolor - typical presentation



Fig 5: Pityriasis versicolor - very extensive involvement. Darker areas - apparently not affected skin.

Lesions may appear all over the body, with the upper trunk, neck and proximal parts of the upper limbs being most commonly affected.

Diagnosis of pityriasis versicolor relies on the classic clinical presentation and microscopic identification of characteristic hyphae and spores in a potassium hydroxide preparation.

Treatment

Treatment may be prolonged, reflect-

ing the difficulty in eliminating normal saprophytic inhabitants and the enigma of predisposing factors, particularly in immunocompetent individuals.

Pityriasis versicolor responds well to 2.5% selenium sulfide shampoo. The shampoo should be applied to the moistened body on at least 10-14 consecutive days. The lather should be washed off after 10 minutes. Alternative remedies include a 20% aqueous solution of sodium thiosulphate (cheap) or topical azoles (ketoconazole, econazole). Azole shampoos or foaming solutions are effective if applied once daily on 3 consecutive days.

When the lesions are widespread or do not respond to topical measures (a rare event, providing the topical treatment is done appropriately), systemic treatment may be considered.

Itraconazole appears to be the drug of choice at the moment⁴. A daily dose of 200mg is taken for 7 days.

The high rate of relapse of pityriasis versicolor warrants prophylactic measures. More is known about the efficacy of systemic than topical prophylactic treatments. In fact, there are no documented studies of topical prophylactic treatment in the literature. My policy is to advise repeated applications of topical antifungals at bi-weekly or monthly intervals. There is, however, no sufficient follow-up information of this regimen.

A recent multicentre study⁵ found that itraconazole 400mg taken once a month (2 tablets of 100mg taken 12 hours apart) was very effective in controlling pityriasis versicolor for 6 consecutive months.

3. Scabies

Scabies is caused by the mite *Sarcoptes scabiei*. It is acquired by close contact with an infected person. Transient contact with ordinary cases of scabies (not with crusted scabies) does not lead to infestation. The mite completes its life cycle in humans and may persist indefinitely unless treatment is performed. Infes-

tation of a new host requires the transmission of just one recently fertilised female mite. Fertilised female mites burrow into the stratum corneum, laying several eggs daily during their 1 to 2 month life span. Within 2 weeks the ova hatch, producing nymphs (immature forms of the mite). Pruritus starts 4 - 6 weeks after infestation, and occurs much earlier when a patient has already been infected before. The length of this latent period indicates that pruritus is due to sensitisation to the mite proteins. Once the itching begins the life of the mite becomes perilous, the burrows are excoriated and mites and eggs destroyed. The host usually keeps the mite number in check and the average number of adult females in ordinary cases of scabies is low, apparently eleven!

Scabies mites live only a few hours outside the body. Survival off the host depends on the temperature and relative humidity. The higher the temperature and relative humidity, the faster mites lose their ability to penetrate human skin.

Transmission by sharing contaminated bedding or clothing does occur, but is uncommon. Attempts to transfer scabies to different animal hosts have been unsuccessful.

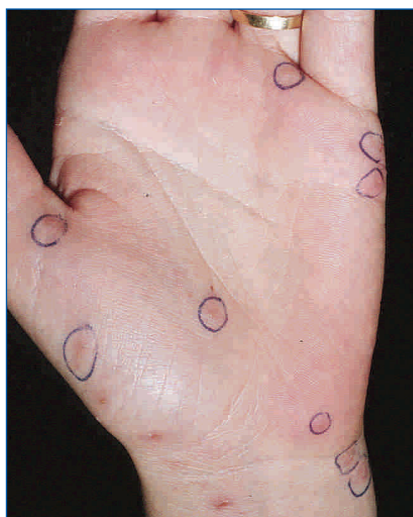


Fig 6: Scabies - burrows are marked.

Clinical picture

There are two main types of skin lesions in scabies: burrows and the

scabies rash.

Burrows (Fig 6) - a brownish irregular line with scaling at one end and sometimes a vesicle at the other end.

Burrows are found mostly in adults on the sides of the fingers and toes, the wrists, the insteps of the feet and on the penis. Burrows are, however, not seen in all patients and are often obliterated by scratching, eczematization and secondary pyogenic infection.

The rash of scabies consists of small, 2 - 5 mm red papules. These papules are mainly found in the skin folds, in the axillae, around the umbilicus and in the inframammary region.

In longer lasting infestations, the lesions are often also found on the lower portion of the buttocks, around the nipples, on the thighs and on the elbows.

Secondary changes, such as excoriation, eczematization and superimposed bacterial infections, complicate the picture. Infants frequently have involvement of the face and head. This is uncommon in adolescents and adults.

The cardinal symptom is severe pruritus, which is more intense at night when there are fewer distractions.

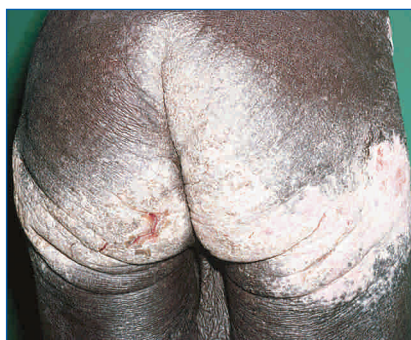


Fig 7: Crusted scabies. Patient suffered from BT Leprosy and had markedly diminished cutaneous sensation.

The clinical presentation of scabies can vary.

Crusted scabies (also known as Norwegian scabies, described by the Norwegians Danielsen and Boeck among leprosy patients) is a variant with thick, crusted lesions containing myriads of mites. Fig 7. This form of scabies is highly contagious, even on casual contact (i.e. patient-doctor)

and often results in local epidemics of ordinary scabies in hospitals and other institutions. Crusted scabies is usually seen in institutionalised, retarded, debilitated or immunocompromised people. The pruritus is often not felt and the host's immunity is reduced.

The diagnosis of crusted scabies is often markedly delayed.

Another peculiar form of scabies, scabies incognito, occurs when the patient has been applying topical corticosteroids. The clinical presentation is often unusual and the location of the lesions atypical. The inflammatory reaction is impeded, but the mites survive and proliferate.

In infants and young children, secondary eczematization frequently hampers recognition. The distribution of the lesions is atypical with face, head and neck involvement. In the elderly, the inflammatory response is often muted but the itch is very severe. In patients with AIDS, scabies may be exaggerated, is often crusted and may present as a generalised papulosquamous psoriasiform eruption with lesions in atypical locations.

Treatment

It is most important to explain to the patient exactly how to use the medication. All family members and those with close physical contact with the patient should be treated simultaneously. Washing of underwear and night clothing is required. It is not necessary to perform a "disinfection".

Regimens

- Benzyl benzoate application: two applications are usually sufficient. On the evening of the first day, apply the emulsion from the neck to the toes. Twelve hours later, apply it again and again leave it for 12 hours. Wash the emulsion off 12 hours after the second application (do not wash it off after the first 12 hours!).
- Esdepallethrin/piperonyl butoxide (Spregal®) aerosol: one applica-

tion is enough. Leave the medication on for at least 12 hours. Wash off after 12 hours.

Treatment of infants and young children

Dilute benzyl benzoate to half-strength as it may irritate the skin.

For lesions on the face and scalp in small children, crotamiton 10% cream (Eurax®), may be prescribed. One application of crotamiton washed off after 24 hours is usually effective. Crotamiton cream may also be used for whole body treatment. Two applications, each left on for 24 hours are needed. Wash off the cream 24 hours after the second application.

Twenty-four hours after effective treatment, the patient can no longer transmit the disease. Pruritus, however, may not clear for several days. Topical weak corticosteroids can be used on residual itchy areas. In some patients the sedative effect of hydroxyzine 25mg orally at bedtime is required to relieve nightly itching.

Crusted scabies usually requires repeated applications of treatments.

4. Larva migrans

Cutaneous larva migrans is a self-limiting skin eruption caused most often by the larvae of dog and cat hookworms. (*Ancylostoma caninum* and *Ancylostoma braziliense*, respectively).

These hookworms reside in the intestines of these domestic animals and their ova are shed with faeces. Under favourable conditions of humidity and temperature, the ova hatch into infectious larvae which may penetrate human skin.

Cutaneous larva migrans is most frequent in warmer climates in shady areas and beaches.

In humans, larvae are not able to complete their natural cycle and remain confined to the skin. When they migrate through the skin, the release of larval secretions (consisting mainly of proteolytic enzymes) produces local inflammatory reactions. The route of larvae migration is manifested by a wandering thread-like line (creeping eruption) which is severely pruritic. Fig 8.

The lesions may occasionally be multiple if penetration of several



Fig 8: Larva migrans. Typical picture.



Fig 9: Less common presentation of larva migrans. Infestation with numerous larvae.

parasites occurs. Fig 9. The process ends with the death of the larvae which takes place between 1 to 3 months in the majority of cases. The most common complication is secondary bacterial infection. The diagnosis of cutaneous larva migrans is fairly easy because of its characteristic clinical picture.

Treatment

The treatment of choice is oral administration of albendazole.⁶ The dose of 400mg once or twice daily for 3 days is effective. Cryotherapy with liquid nitrogen is a rather imprecise way to localise and kill the larvae. The larval tract reflects an allergic reaction to the larva and does not indicate the actual location of the parasite.✚

See CPD Questionnaire p.43

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