

# Diagnostic approach to tropical skin infections

Elinor M Moore

## Abstract

An approach to the diagnosis of tropical skin infections is described with emphasis on the important aspects of the history and clinical examination. In particular, the importance of taking a detailed travel history is highlighted, with focus on the precise details of the geographical areas of travel by a patient, and the activities undertaken whilst abroad. Diagnostic algorithms of the main dermatological presentations of ulcers/weeping spots, patches/plaques, and papules/nodules are presented. The key differential diagnoses of tropical skin infections are highlighted, including those conditions common in temperate regions that may be more common in the tropical environment. As HIV is common in the 'tropical' settings, skin conditions that are worsened by HIV are highlighted. Selected tropical skin infections are described in detail and a brief description of investigations that may be appropriate.

**Keywords** cutaneous larva migrans; cutaneous leishmaniasis; leprosy; myiasis; onchocerciasis; PVL *Staphylococcus aureus*; tropical skin infection; tropical ulcers

## Introduction

Skin conditions are common in travellers returning from the tropics. In the Europe-wide GeoSentinel surveillance network, 18% of patients seeking healthcare after tropical travel had a skin-related condition.<sup>1</sup> In one study of returning travellers, only 53% of those with a skin condition had an infectious aetiology.<sup>2</sup> Skin conditions seen in temperate regions may be more prevalent in tropical environments. These include scabies, impetigo, fungal infections and eczema. Other conditions are specific to tropical environments. HIV prevalence is high in many 'tropical' countries in the tropics, accounting for the high prevalence of certain HIV-related skin conditions found in the tropics, or after tropical travel. Since the range of skin infections seen in the tropics is very wide this article will concentrate on the suggested diagnostic approach, with a focus on the most important tropical skin conditions likely to be seen in general medical practice. Fever and rash are covered separately (see Fever and rash on pages 96–99 of this issue).

## History

The key to diagnosing a tropical skin condition is to start with a thorough history focusing on the following areas.

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## What's new?

- The awareness that Pantone–Valentine leukocidin-positive *Staphylococcus aureus* can cause problematic skin and soft tissue infections after tropical travel

## Geographical location of travel

Some skin infections, such as cutaneous leishmaniasis and onchocerciasis, occur in well-defined geographical locations. Simply knowing the countries visited may not be sufficient detail for diagnostic certainty (see map of cutaneous leishmaniasis – Figure 1).<sup>3</sup>

## Activities undertaken whilst travelling

Asking returning travellers about the types of activities undertaken whilst in the tropics can be helpful. Cutaneous larva migrans can be acquired after holidaying on sandy beaches. Bush or jungle trekking leaves travellers at risk of tick typhus or cutaneous leishmaniasis. Patient reports of being bitten by 'sandflies' can be misleading as true *Phlebotomus* sandflies that cause cutaneous leishmaniasis are tiny night-biting flies that are rarely seen, unlike the range of innocuous flies that live in sand and cause nothing more than irritating bites. Personal habits are also worth enquiring about: myiasis can occur after wearing unironed clothes in Africa, tungiasis can result from barefoot walking and bed-bug bites can occur whilst sleeping in dirty bedding. A careful sexual history should also be taken as several sexually transmitted infections, including HIV and syphilis, cause rashes (see Fever and rash on pages 96–99 of this issue).

## Timing of the skin condition in relation to travel

Establishing the timing of skin lesions can be helpful. Insect bite reactions rarely occur more than a week after return from the tropics. Secondary bacterial infection of insect bites can cause lesions to persist for longer than a week. However, if an 'insect bite' is still causing problems after 3–4 weeks, alternative diagnoses such as myiasis or cutaneous leishmaniasis should be considered.

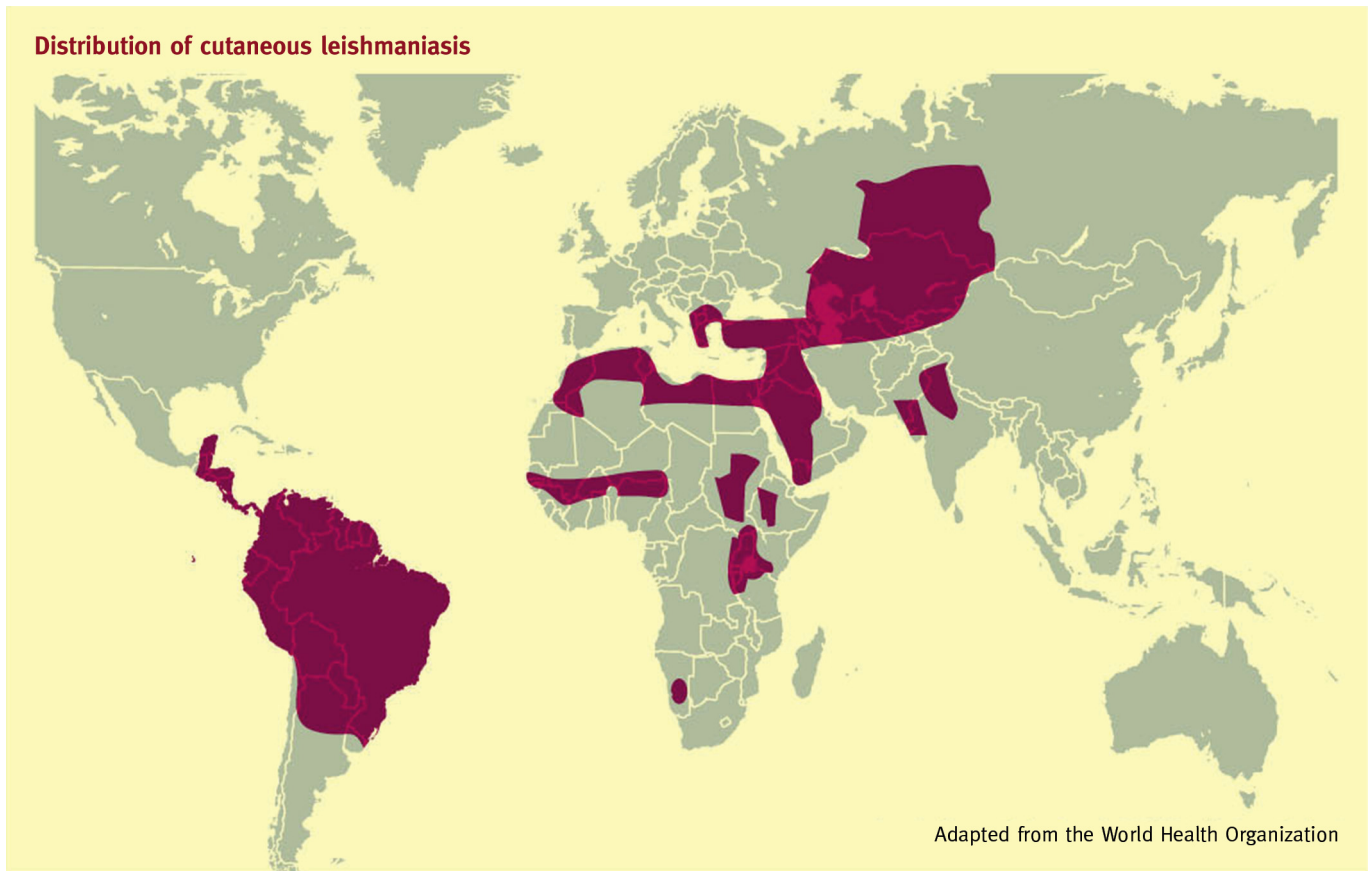
A person can present with leprosy years after leaving an endemic area. Leprosy would be highly unlikely in those who have visited but not lived in a leprosy endemic area.

## Evolution of the lesion

The evolution of the skin lesion can give a clue to the diagnosis. Weeping or pustular insect bites may be initially thought to have a secondary bacterial infection. If standard antimicrobial treatment fails and the lesions gradually enlarge and ulcerate over many weeks, cutaneous leishmaniasis should be considered. Some 'Old World' cutaneous leishmaniasis lesions may spontaneously resolve after a year or two, starting with healing at the centre of the lesion. A lesion that started in one area and then 'moved', leaving a track or line ('serpiginous'), is typical of cutaneous larva migrans.

## Systemic symptoms

It is important to clarify whether there are any associated systemic symptoms that may indicate that the skin lesion is simply



**Figure 1**

part of a systemic disease for example a skin eschar as a presenting feature of rickettsial diseases, (see Fever and rash on pages 96–99 of this issue).

### Examination

A general physical examination may give clues to important underlying conditions, in particular HIV. The skin conditions that are worsened by HIV are highlighted with an asterisk in the figures. Examination of the skin can divide lesions morphologically into ulcers and weeping spots (Figure 2), patches or plaques (Figure 3), and nodules or papules (Figure 4).<sup>4–10</sup> Some conditions can have more than one of these (at different times).

### Common tropical skin infections

**Problematic insect bites:** a range of different insect bites can give rise to allergy or superadded infection, abscesses and cellulitis. There has been increasing recognition that travellers have a higher incidence of acquisition of carriage of a strain of *Staphylococcus aureus* with the virulence factor Pantón–Valentine leukocidin (PVL). This appears to give rise to a higher incidence of complicated skin and soft tissue infections.<sup>11</sup>

**Cutaneous leishmaniasis** is a parasitic disease spread by *Phlebotomus* sandflies. Lesions develop at the site of the sandfly bite, typically in ‘exposed’ areas. It may present as a nodule but more typically an ulcer with a thick crust covering a haemorrhagic base (Figure 5). There is usually a raised, solid, active border and

occasionally evidence of local lymphangitis. It can be divided into ‘Old World’ (Mediterranean, Asia and the Middle East) and ‘New World’ (Latin America) leishmaniasis. New World lesions have the ability to spread to mucocutaneous areas, causing massive facial tissue destruction, and are therefore treated more aggressively. This dogma has been challenged recently due to a re-analysis of the risk of mucocutaneous spread and oral treatment may be considered for certain groups of patients.<sup>12</sup> Cutaneous leishmaniasis should be treated in specialist centres.

**Cutaneous larva migrans** results from the subcutaneous migration of dog hookworm larvae. The dog hookworms are commonly found in sandy beach areas throughout the tropics where dogs are allowed to defecate freely. An itchy track occurs on exposed skin, which over a number of days or weeks will be seen gradually to migrate. The dog hookworm larvae accidentally penetrate human skin (the dog is the preferred host) and are unable to enter the human body further than the subcutaneous tissues; after several weeks they will eventually die.

**Larva currens** is a rapidly moving and transient urticarial weal (approximately 1–10 cm/hour) caused by the migrating larva of *Strongyloides stercoralis*. It is profoundly itchy and usually seen in the perianal area and upper thighs.<sup>13</sup>

**Myiasis** occurs when dipteran flies lay eggs that penetrate the skin and develop as larvae within the skin. In Africa, *Cordylobia* species (‘tumbu fly’) is the commonest; it typically lays eggs on

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