

COMMENTARY (see article on pp. 62–66)

Cutaneous Leishmaniasis and Human Conflict

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Cutaneous leishmaniasis (CL) is a parasitic infection caused by a number of different *Leishmania* species affecting some 0.7–1.3 million people annually worldwide. There are different clinical manifestations of the condition, including skin lesions associated with the deep form or visceral leishmaniasis, kala-azar. Skin lesions typically occur on exposed body parts and can result in permanent scarring and, depending on the site of the lesion, disfigurement. Ninety-five percent of these cases occur in the Americas, Mediterranean basin, Middle East and Central Asia (1). Old World CL is most frequently caused by *Leishmania* species such as *L. major*, *L. infantum* and *L. tropica*, and these vary in terms of clinical presentation, regional and seasonal distribution (2). Whilst the prevalence of CL is variable, in many such areas it remains at a relatively stable level of endemicity, depending on a number of factors including the organisms, host prevalence and vector. Transmission may be zoonotic (mainly *L. major*) where the reservoir hosts are other mammals such as rodents and canines; this type is more prevalent rurally. With some species such as *L. tropica* transmission may be anthroponotic, where the main reservoir host is the human and infection is transmitted by sandflies such as *Phlebotomus sergenti*. Rarely direct human-to-human transmission via blood products without an intermediate host has been reported.

Epidemic Leishmaniasis

From time to time this semi-stable endemic CL is grossly disturbed and huge numbers of new cases occur over a short period. Epidemics may occur in densely populated cities, but also with the movement of populations into and out of endemic areas. War and conflict zones, refugee camps and large-scale population migration are associated with outbreaks of this disease whereby large numbers of people are suddenly displaced and local health infrastructure becomes rapidly compromised. The association between large outbreaks of CL and human warfare has been documented in recent centres of crisis in the Middle East, Sudan, Afghanistan and Pakistan where it has affected refugees and migrants as well as military personnel (3–7).

Reasons for these outbreaks are likely to be multifactorial. Anthroponotic or human-to-human transmission increases the risk of infection within crowded populations. Migration of non-immune people into areas with existing transmission cycles and migration

of human hosts may introduce CL into new populations not previously endemic. Other risk factors include poor housing and sanitary conditions with lack of waste management and gross household overcrowding, which are likely to increase sandfly breeding and resting sites, promoting transmission. Saroufim et al. (8) report makeshift houses of rubble and tents, with inadequate sanitation, waste disposal and insulation in Syrian refugee camps in Lebanon and such temporary settlements are ideal areas for enhanced transmission.

Sandflies infected by some *Leishmania* species are also more likely to feed from multiple hosts which may also amplify the transmission in a densely populated environment (9).

The situation in Syria

The current situation in Syria has all the necessary conditions for such a cataclysmic event. By the end of 2013, escalating conflict had displaced an estimated 6.5 million people (10). The first reports of problems became apparent amongst refugees displaced by the war to Lebanon and Turkey (8, 11). However, now Hayani et al. (12) draw attention to the extent of the situation in Syria itself, which previously has not been reported. They describe a 2–4-fold increase in incidence of CL in Syria between 2011 and 2013. This will be under-representative as there is no documentation in most parts of the country. Hayani et al. (12) also highlight another reason for delay in diagnosis, the many variations in clinical presentation with cases mimicking atopic eczema, acne, chickenpox, sarcoidosis, adnexal tumours and basal cell carcinomas. This presents a challenge to initial recognition by generalist and hard-pressed health care workers and also for diagnosis and treatment where resources are scarce and intermittently available.

Interventions

Importantly, a good response to pentavalent antimonials, which had been available in Syria, was reported; other potential treatments including miltefosine and liposomal amphotericin were not available. Widescale shortages of medication and limited access to drugs have now escalated. However simple interventions are also likely to have a significant impact on control of such an epidemic. Faulde et al. (2) recommend ra-

pid strategies aimed at reducing sandfly breeding and resting sites, long-lasting insecticide-treated bednets, curtains and window-screening and in-house spraying and outdoor fogging of residual insecticide to control outbreaks of anthroponotic CL.

Due to its high global burden, CL is listed as one of the World Health Organisation's Neglected Tropical Diseases. Awareness and prevention should be prioritised to reduce the global impact. However, this becomes even more challenging during conflict and unfortunately the dire situation in Syria, and adjacent areas, shows little sign of resolution. While devising new preventative measures such as immunisation is critical to control outbreaks and prevent future epidemics, in the current situation in the Middle East identifying the most simple strategies to limit spread of cutaneous leishmaniasis is an urgent priority.

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