

# Cutaneous and mucocutaneous leishmaniasis

## Clinical perspectives

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### Learning objectives

After completing this learning activity participants should be able to recognize the cutaneous lesions in immigrants and travelers from endemic areas with leishmanial and delineate the modalities used in the diagnosis of the cutaneous lesions of leishmaniasis.

### Disclosures

#### Editors

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Leishmaniasis is endemic in 98 countries and territories, with 1.2 million new cases per year, making it a worldwide concern. The deadly visceral form is a leading cause of death from tropical parasitic infections, second only to malaria. Leishmaniasis appears to be increasing in many countries because of extended urbanization. The disease reservoir includes small mammals; parasite transmission occurs via bite of the female phlebotomine sandfly. Disease manifestations vary and largely depend upon the *Leishmania* species acquired. It may be first evident with a range of findings—from a localized cutaneous ulcer to diffuse painless dermal nodules—or, in the mucocutaneous form, ulceration of the oropharynx. In the potentially deadly visceral form, the internal organs and bone marrow are affected. (J Am Acad Dermatol 2015;73:897-908.)

**Key words:** bat; dog; gerbil; kala-azar; leishmaniasis; parasitic disorders; protozoan diseases; rodents; sandfly; tropical diseases; ulcer.

## INTRODUCTION

Leishmaniasis is a widespread parasitic disease that is seen predominantly in children and young adults, although it may occur at any age. Because of the enhanced opportunity for exposure and possibly not having a full developed immune system, children may be more susceptible to infection than adults.<sup>1</sup> Children are most vulnerable to being bitten by the sandfly, which transmits the *Leishmania* parasite,

### Abbreviations used:

LRV: Leishmania RNA virus  
PKDL: post-kala-azar dermal leishmaniasis  
WHO: World Health Organization

while indoors asleep or while outdoors.<sup>2-4</sup> This disorder can affect both visceral organs and cutaneous surfaces (Table 1). In its more common

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cutaneous form, it is characterized by ulcers on the face and extremities, which, even after healing, may disfigure a child and lead to social stigma.<sup>6-8</sup> The World Health Organization (WHO) estimates that up to 1.2 million cases of cutaneous leishmaniasis occur each year in 98 countries and territories on 5 continents.<sup>9</sup> In its visceral form, which affects up to 400,000 people worldwide each year, the mortality rate is 10%, making it the second most deadly tropical parasitic infection in the world after malaria.<sup>9,10</sup> Unlike visceral leishmaniasis, which is concentrated in India, Bangladesh, South Sudan, Sudan, Brazil, and Ethiopia, cutaneous leishmaniasis is evenly distributed in Western Asia, the Mediterranean region, and Latin America.<sup>9,11</sup> A recent rise in diagnoses in the United States has been noted and is attributable to international travel to and from endemic regions, whether by immigrants, refugees, tourists, or soldiers.<sup>9,12,13</sup> Cutaneous leishmaniasis is endemic in southern Texas, and may also be so in northeastern Texas and southeastern Oklahoma, where a growing number of cases are being reported.<sup>13-16</sup>

## HISTORY

### Key points

- **The organism was first observed by Cunningham in 1885**
- **In 1903, leishmaniasis, named for William Leishman, was described as causative agent of kala-azar**
- **In 1942, sandflies were proven to be the vector of leishmaniasis**

Incan clay pottery depicting mutilations and other deformities suggests that American leishmaniasis may have been present during pre-Columbian times.<sup>17</sup> The *Leishmania* organism was first observed by Cunningham<sup>18</sup> in 1885 using tissue specimens from a “Delhi boil.”<sup>19,20</sup> He concluded that the responsible organism was not bacterial, which was the popular belief at that time. Borovsky, a Russian military surgeon working in Tashkent in 1898, described the organism in further detail, observing that the parasite was a protozoan.<sup>19,21</sup> His findings were independently confirmed by Wright in 1903.<sup>20</sup> In that same year, the causative agent of kala-azar was described by both William Leishman<sup>22</sup> in London and Charles Donovan<sup>23</sup> in Chennai.<sup>20</sup> Although by 1928 induction of cutaneous leishmaniasis was observed in those bitten by sandflies of the genus *Phlebotomus*, it was not until 1942 when sandflies were decisively proven to be the vector for both cutaneous and visceral leishmaniasis.<sup>21,24,25</sup> Only female phlebotomine sandflies have been found to be vectors. Vectorial

**Table I.** Types of leishmaniasis

Leishmaniasis syndromes	Presentation
Cutaneous	Onset within several weeks or months of exposure; typically progress from small papules to plaques and then to painless ulcers; regional lymphadenopathy and satellitosis may be evident
Mucocutaneous	In those infected in the Americas; may present years after cutaneous lesions have healed; presents as nasal congestion, bleeding, and mucosal erosions or inflammation; the mouth is less commonly affected than the nose; perforation of the nasal septum and destruction of the mouth, nose, and pharynx may occur
Visceral	Weeks to months after sandfly bite, those who become symptomatic may have fever, hepatosplenomegaly, weight loss, and pancytopenia; affects internal organs, typically the spleen, liver, and bone marrow

Data from Peters et al.<sup>5</sup>

competence of sandflies for different species of *Leishmania* is controlled by surface structural polymorphisms.<sup>26</sup>

## EPIDEMIOLOGY

### Key points

- **Leishmaniasis is endemic to all continents except Australia and Antarctica**
- **The worldwide prevalence of people infected with leishmaniasis is estimated at 12 million**
- **Its incidence in the United States is on the rise**
- **It appears to be becoming more common worldwide because of urbanization**
- **Ninety percent of new infections occur in Afghanistan, Iran, Saudi Arabia, Syria, Brazil, and Peru**

Leishmaniasis is caused by protozoan parasites from more than 20 *Leishmania* species. This disease is endemic in every continent except Australia and Antarctica. Among the WHO's list of “neglected” tropical infections, the estimated disease burden of leishmaniasis places it second in mortality and fourth in morbidity worldwide.<sup>10,27</sup> The incidence of cutaneous leishmaniasis in the United States has

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