

# HANSEN'S DISEASE

Also known as Leprosy

## ✓ DISEASE AND EPIDEMIOLOGY

### Clinical Description:

The disease presents along a clinical spectrum between two forms: lepromatous and tuberculoid leprosy. Borderline leprosy has features of both, with a tendency to shift toward the lepromatous form in the untreated patient and toward the tuberculoid form in the treated patient. Indeterminate leprosy is an early form that may develop into any of the other forms.

#### **Lepromatous:**

The lepromatous form of leprosy usually exhibits extensive and bilaterally symmetrical skin nodules, papules, and macules, as well as diffuse infiltration of the face, hands, and feet. Nasal mucosa and ocular involvement may lead to obstructed breathing and eye inflammation.

#### **Tuberculoid:**

The tuberculoid form of leprosy usually exhibits a limited number of well demarcated skin lesions with spreading edges and a clearing center. The lesions are anesthetic or hypaesthetic (have absent or reduced sensation) and are bilaterally asymmetrical. Significant peripheral nerve involvement may occur. Loss of sensation resulting from nerve involvement can lead to serious consequences, including ulcerations, fractures, and bone resorption.

### Causative Agent:

Hansen's disease (also called leprosy) is a chronic infectious disease caused by the bacterium *Mycobacterium leprae*.

### Differential Diagnosis:

The differential diagnosis usually involves differentiation of the lesions from those caused by yeast/fungi, sarcoid, lupus, etc.

### Laboratory identification:

Leprosy is generally identified through a pathologist's analysis of a skin biopsy.

**UPHL:** UPHL does not have capability to detect or confirm leprosy, but can facilitate confirmatory testing through the CDC.

### Treatment:

Treatment usually includes long-term therapy with dapsone, rifampin, and/or clofazimine.

### Case fatality:

With appropriate treatment, Hansen's disease is a chronic illness and fatality would be extremely rare.

### **Reservoir:**

Humans are the only reservoir of proven significance for leprosy. There have been reports suggesting that leprosy in armadillos may be naturally transmitted to humans.

### **Transmission:**

The exact mechanism for the acquisition and transmission of leprosy is not known. However, household contact and prolonged close contact may result in transmission. Large numbers of the organism are shed in the nasal discharge of untreated patients with lepromatous leprosy, and the bacilli may remain viable in dried nasal secretions for at least seven days. Large numbers of bacilli are also shed in the skin lesions in the lepromatous form of leprosy.

### **Susceptibility:**

Host response appears to play a role in the development of disease. Thus, consanguineous relatives are at highest risk of disease acquisition/transmission.

### **Incubation period:**

The incubation period is unclear but seems to range from nine months to twenty years, but is usually 2-5 years.

### **Period of communicability:**

The infectious period depends on the type of leprosy and treatment. This can range from a few days to up to three months, and it is questionable whether the tuberculoid form of leprosy is infectious at all.

### **Epidemiology:**

During 2002, 620,000 persons were diagnosed with leprosy worldwide, with Brazil, India, Madagascar, Mozambique, Tanzania, and Nepal reporting 90% of the cases. Cases in the U.S. are rare; only 96 cases were reported in 2002 in the U.S. Additionally, cases in the U.S. typically occur in immigrants or refugees whose disease was acquired in their native countries. However, there are pockets of endemicity in California, Hawaii, Louisiana, Texas, and Puerto Rico. Although leprosy affects people of all ages and gender, cases in individuals under three years of age are rare. Worldwide, 1–2 million people are permanently disabled as a result of leprosy. Those receiving antibiotic treatment or having completed treatment are considered free of active infection.

## **PUBLIC HEALTH CONTROL MEASURES**

### **Public health responsibility:**

- Investigate all suspect cases of disease and fill out and submit appropriate disease investigation forms.
- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention.

- Education of the case should stress the availability and efficacy of therapy. Additionally, education of the case's household contacts (as identified on the line listing in the surveillance form; see Section 3C for more information) should include modes of transmission and referral to a health care provider for follow-up.

It is important to convey to the case and to the contacts the very low communicability of this disease and the availability of effective treatment and prevention regimens.

### **Prevention:**

Community and individual perceptions about leprosy may reflect inaccurate concerns about communicability and about the health implications for those diagnosed. These concerns may not be valid with regard to the nature of the disease, treatment, and prevention methods. It is important to convey to all concerned parties, the low communicability of this disease and the availability of effective treatment and prevention regimens. Similarly, it is important to strictly enforce confidentiality of case information; information should be released only to appropriate agencies and individuals, who need to know, and to the greatest extent possible, with the knowledge and consent of the case.

### **Chemoprophylaxis:**

None.

### **Vaccine:**

None.

### **Isolation and quarantine requirements:**

**Isolation:** If under appropriate medical care, patients need not be isolated.

**Hospital:** No special isolation precautions required; use standard body substance precautions (BSP). Patients with multiple draining lesions should be placed into a private room. Use personal protective equipment, such as gloves, gown, and mask, as needed to prevent contact with secretions and excretions.

**Quarantine:** None.

## **CASE INVESTIGATION**

### **Reporting:**

Report any case with demonstration of acid-fast bacilli in skin or dermal nerve obtained from a full-thickness skin biopsy. Typically, the diagnosis of leprosy is made by a pathologist rather than a microbiology lab. Public health needs to work with pathologists to assure a reporting mechanism exists for this disease. Those cases that have been identified in Utah have had lengthy delays in reporting. All individuals with knowledge of disease have the responsibility to report.

All cases of Hansen's disease are reportable to the USPHS National Hansen's Disease Program.

## Case definition:

### **Hansen's disease (1997):**

#### **Clinical Description**

A chronic bacterial disease characterized by the involvement primarily of skin as well as peripheral nerves and the mucosa of the upper airway. Clinical forms of Hansen's disease represent a spectrum reflecting the cellular immune response to *Mycobacterium leprae*. The following characteristics are typical of the major forms of the disease:

- *Tuberculoid*: one or a few well-demarcated, hypopigmented, and anesthetic skin lesions, frequently with active, spreading edges and a clearing center; peripheral nerve swelling or thickening also may occur
- *Lepromatous*: a number of erythematous papules and nodules or an infiltration of the face, hands, and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin
- *Borderline (dimorphous)*: skin lesions characteristic of both the tuberculoid and lepromatous forms
- *Indeterminate*: early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features.

#### **Laboratory Criteria**

Demonstration of acid-fast bacilli in skin or dermal nerve, obtained from the full-thickness skin biopsy of a lepromatous lesion

#### **Case Classification**

*Confirmed*: a clinically compatible case that is laboratory confirmed

## Case Investigation Process:

- Fill out morbidity and investigation forms
- Hansen's disease is usually imported, so an important part of the investigation is to determine where the disease transmission occurred.

## Outbreaks:

An outbreak will be defined as: any case of Hansen's disease in a Utah resident without a readily explainable travel history.

## Identification of case contacts:

Public health should identify household contacts and others with prolonged close contact with the patient. This disease is not easily transmitted.

## Case contact management:

All household contacts and first and second-degree relatives should receive an examination consisting of a complete body skin exam, peripheral nervous system exam,

and a history of neurologic symptoms. At this time, routine dapsone prophylaxis is not recommended.

## ✓ REFERENCES

Active Bacterial Core Surveillance Report, Emerging Infections Program Network, Centers for Disease Control, 2005.

Centers for Disease Control, Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR 46 (RR-10), 1997.1

Control of Communicable Diseases Manual (18<sup>th</sup> Edition), Heymann, D.L., Ed; 2004.

Red Book: 2003 Report of the Committee on Infectious Diseases (26<sup>th</sup> Edition), Larry K. Pickering MD, Ed; 2003.

Principles and Practice of Infectious Disease (6<sup>th</sup> Edition), Gerald L. Mandell, John E. Bennett, and Raphael Dolin Eds; 2005.

Massachusetts Department of Public Health, Guide to Surveillance, Reporting and Control, 2006.

ARUP Labs; Physician's Guide to Laboratory Test Selection and Interpretation

Johns Hopkins Point of Care Information Technology