leprosy

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Presentation outline

- Introduction
- Classification
- Diagnosis
- Some general data
- Treatment
- Epidemiological data

Introduction

- Leprosy is a chronic infectious disease caused by Mycobacterium leprae, an acid-fast, rod-shaped bacillus.
- Leprosy has caused fear into human beings for thousands of years, and was well recognized in the oldest civilizations of China, Egypt and India. A cumulative total of the number of individuals who, over the millennia, have suffered its chronic course of incurable disfigurement and physical disabilities can never be calculated.
- Since ancient times, leprosy has been regarded by the community as a contagious and incurable disease.

Introduction

- When M.leprae was discovered by G.A. Hansen in 1873, it was the first bacterium to be identified as causing disease in man.
- However, treatment for leprosy only appeared in the late 1940s with the introduction of dapsone, and its derivatives. Leprosy bacilli resistant to dapsone gradually appeared and became widespread.

- *Incubation period*: months to years
- The evolution of the disease depends on the patient's immune response

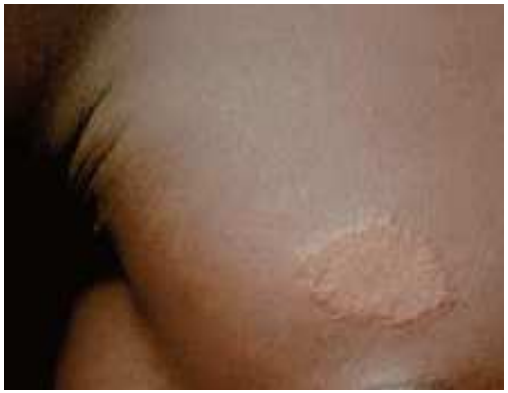
Classification

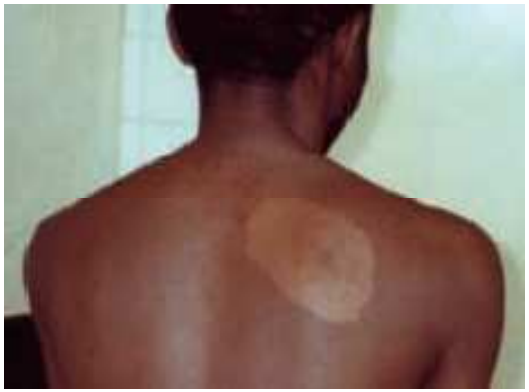
Leprosy can be classified on the basis of clinical manifestations and skin smear results.

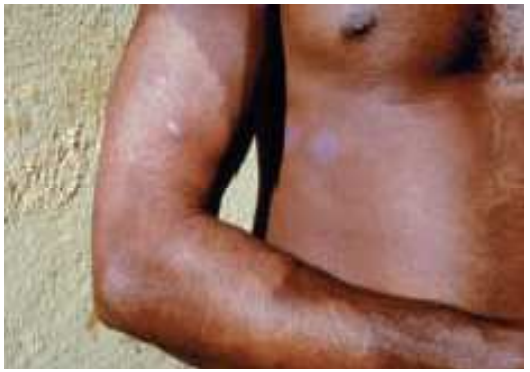
1. In the classification based on skin smears, patients showing negative smears at all sites are grouped as ***paucibacillary*** or ***tuberculoid*** leprosy (PB). In this case there is a strong but ineffective immune response that keeps mycobacterium numbers at a very low levels but also damages microbe infected peripheral nerves and skin
2. On the other hand those showing positive smears at any site are grouped as having ***multibacillary or lepromatous*** leprosy (MB). In this case there is an ineffective immune response so the disease becomes generalized involving multiple organ system (bones, eyes respiratory system)
3. Between these lines lie those with the so called ***bordeline*** disease

- However, in practice, most programmes use clinical criteria for classifying and deciding the appropriate treatment regimen for individual patients, particularly in view of the non-availability or non-dependability of the skin-smear services. The clinical system of classification for the purpose of treatment includes the use of number of skin lesions and nerves involved as the basis for grouping leprosy patients into multibacillary (MB) and paucibacillary (PB) leprosy.
- While classifying leprosy, it is particularly important to ensure that patients with multibacillary disease are not treated with the regimen for the paucibacillary form of the disease.

Clinical features *skin*







Clinical features *skin*

- Skin lesions: hypopigmented anaesthetic macules, papules, or annular lessions.
- Erythema nodosum occurs in lepromatous disease especialy in the 1st year of treatment.

How to test for sensory loss

- **Leprosy patches:**
  - Can be pale or reddish or copper-coloured;
  - Can be flat or raised;
  - Do not itch;
  - Usually do not hurt;
  - Lack sensation to heat, touch or pain;
  - Can appear anywhere.
- **Other signs of leprosy include:**
  - Reddish or skin-coloured nodules or smooth,
  - shiny diffuse thickening of the skin without a loss of sensation

Clinical features *nerve lesions*

- Mayor peripheral nerves may be involved leading to much disability.
- Sometimes a thickened sensory nerve may be felt running into the skin lesion, e.g. Ulnar nerve above the elbow, median nerve at the wrist or the great auricular nerve behind the ear
- A thickened nerve is often accompanied by other signs as a result of damage to the nerve. These may be ***loss of sensation*** in the skin and ***weakness of muscles*** supplied by the affected nerve. In the absence of these signs, nerve thickening by itself, without sensory loss and/or muscle weakness is often not a reliable sign of leprosy.

Clinical features *Other organs*

- Eyes: blindness. Also nerves palsy, lagophthalmos, ingrowing eyelashes (trichiasis)
- Lymphadenopathy
- Bones: bone cyst, aseptic necrosis
- Kidneys
- Mucous membrane ulceration e.g. Upper respiratory tract

Diagnosis of leprosy

- In an endemic country or area, an individual should be regarded as having leprosy if he or she shows ONE of the following cardinal signs:
  - skin lesion consistent with leprosy and with definite sensory loss, with or without thickened nerves
  - positive skin smears

Positive skin smears: In a small proportion of cases, rod-shaped, red-stained leprosy bacilli, which are diagnostic of the disease, may be seen in the smears taken from the affected skin when examined under a microscope after appropriate staining. ***The more the organisms, the greater the chance that some will be drug resistant***

- ***Transmission of leprosy-age***
- Leprosy is known to occur at all ages ranging from early infancy to very old age.

- ***Method of transmission of leprosy***
- *The exact mechanism of transmission of leprosy is not known*.

- ***Sex distribution***
- Although leprosy affects both sexes, **in most parts of the world males are affected more frequently than females often in the ratio of 2:1.**
- *It should be pointed out that the male preponderance in leprosy is not universal and there are several areas, particularly in Africa, where there is either equal occurrence of leprosy in the two sexes, or occasionally even a higher prevalence among females. Such situations have been observed in Uganda, Nigeria, Malawi, Gambia, Burkina Faso, Zambia, Thailand and Japan.*

Inactivation of disease

- Where leprosy treatment facilities exist, inactivation or cure due to specific treatment is an important mode of elimination of cases from the prevalence pool.
- Even in the absence of specific treatment, a majority of patients, ***particularly of the tuberculoid*** **and** ***indeterminate types*****, tend to get cured spontaneously**.
- An earlier study in India had shown that over a period of 20 years, the extent of spontaneous regression among children with tuberculoid leprosy was about 90%. A study in Culion Island in the Philippines showed that among children self-healing occurred in 77.7% of cases (Lara & Nolasco, 1956). A later study in South India involving long-term follow-up of a high endemic population showed that among newly detected tuberculoid cases of all ages and both sexes, the rate of inactivation was 10.9% per year, the bulk of inactivation in the study being spontaneous (Noordeen, 1975).

- **Reservoir of infection**
- Among human beings it is the lepromatous cases that carry the largest load of organisms, the maximum load reaching over seven billion organisms per gram of tissue.

  Patients with non-lepromatous cases carry a very much smaller bacillary load, probably not exceeding one million organisms in total.

- **Portal of exit of M.leprae**
- The two portals of exit of M.leprae often described are the ***skin*** and the ***nasal mucosa***. However, the relative importance of these two portals is not clear.
  - It is true that the lepromatous cases show large numbers of organisms ***deep down in the dermis***. However, whether they reach the skin surface in sufficient numbers is doubtful. Although there are reports of AFB being found in the desquamating epithelium of the skin, Weddell et al (1963a) have reported that they could not find any AFB in the epidermis even after examining a very large number of specimens from patients and contacts.
  - Regarding the ***nasal mucosa***, its importance has been recognized as early as 1898 by Schaeffer (1898), particularly tht of the ulcerated mucosa. The quantity of bacilli from nasal mucosal lesions in lepromatous leprosy has been demonstrated by Shepard (1960) as large, with counts ranging from 10 000 to 10 000 000. Pedley (1973) has reported that the majority of lepromatous patients showed leprosy bacilli in their nasal secretions as collected through nose blows. Davey & Rees (1974) have indicated that nasal secretions from lepromatous patients can yield as much as 1 million viable organisms per day.

- **Viability of M.leprae outside the human host**
- The possiblity of discharge of M.leprae from the nasal mucosa raises the question of survival of the discharged organisms outside the human host. Davey & Rees (1974) have reported that M.leprae from the nasal secretions can survive up to 36 hours or more. Desikan (1977) has reported on the survival of M.leprae in nasal secretions under tropical conditions *for up to nine days. Such survival of the organisms suggests the possibility of contaminated clothing and other fomites acting as sources of infection.*

- **Portal of entry of M.leprae**
- The portal of entry of M.leprae into the human body is not definitely known. However, the two portals of entry seriously considered are the skin and the upper respiratory tract. With regard to the respiratory route of entry of M.leprae, the evidence in its favour is on the increase in spite of the long-held belief that the skin was the exclusive portal of entry.

- In summary, although no firm conclusions can be reached with regard to the portal of entry, entry through the respiratory route appears most probable, although other routes, particularly broken skin, cannot be ruled out.

Management

- ***Paucibacillary leprosy***
  - Rifampicin 600 mg monthly
  - Dapsone 100 mg daily
- Given for 6 months. Patient non infectious after the 2st dose of rifampicin

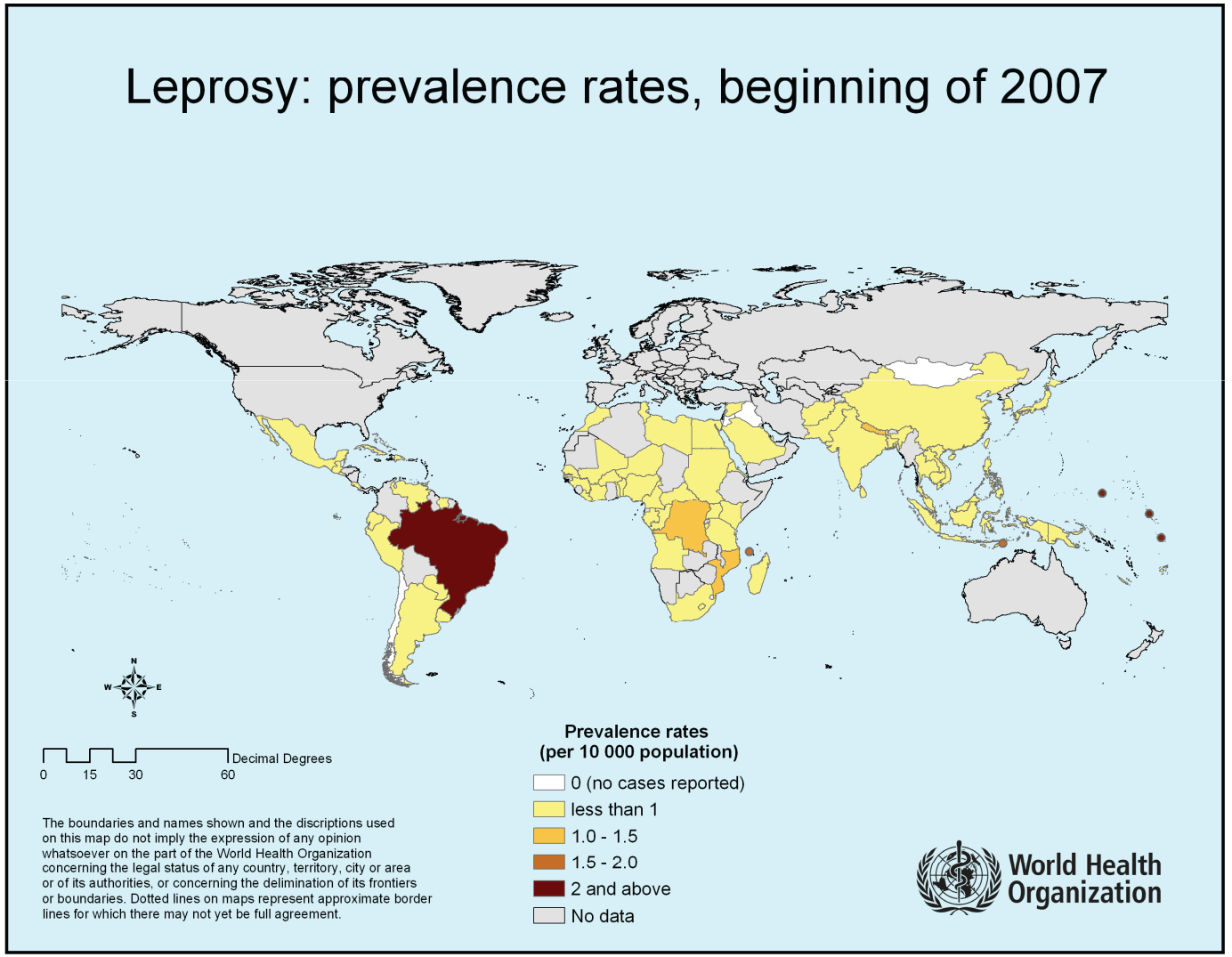
- ***Multibacillary and bordrer line disease***
  - Rifampicin 600 mg monthly
  - Dapsone 100 mg daily
  - Clofazimine 50 mg daily plus 300 mg monthly
  - Given for 2 years. Patient non infectious after 4 -6 doses of rifampicin
  - In single skin lession Rifampicin 600 mg, ofloxacin 400mg, minocycline 100mg, all PO together

Adverse reactions: dying bacilli, permanent paralysis – nerve inflammation (thalidomide *not in pregnant*)

Management

- If already severe peripheral neuropathy advise the patient to:
- Keep hands under constant observation for swelling or sensory changes
- Protection from trauma
- Check feet for ulcers. Loss of light touch?
- Soak feet regularly, remove callus

Epidemiological data



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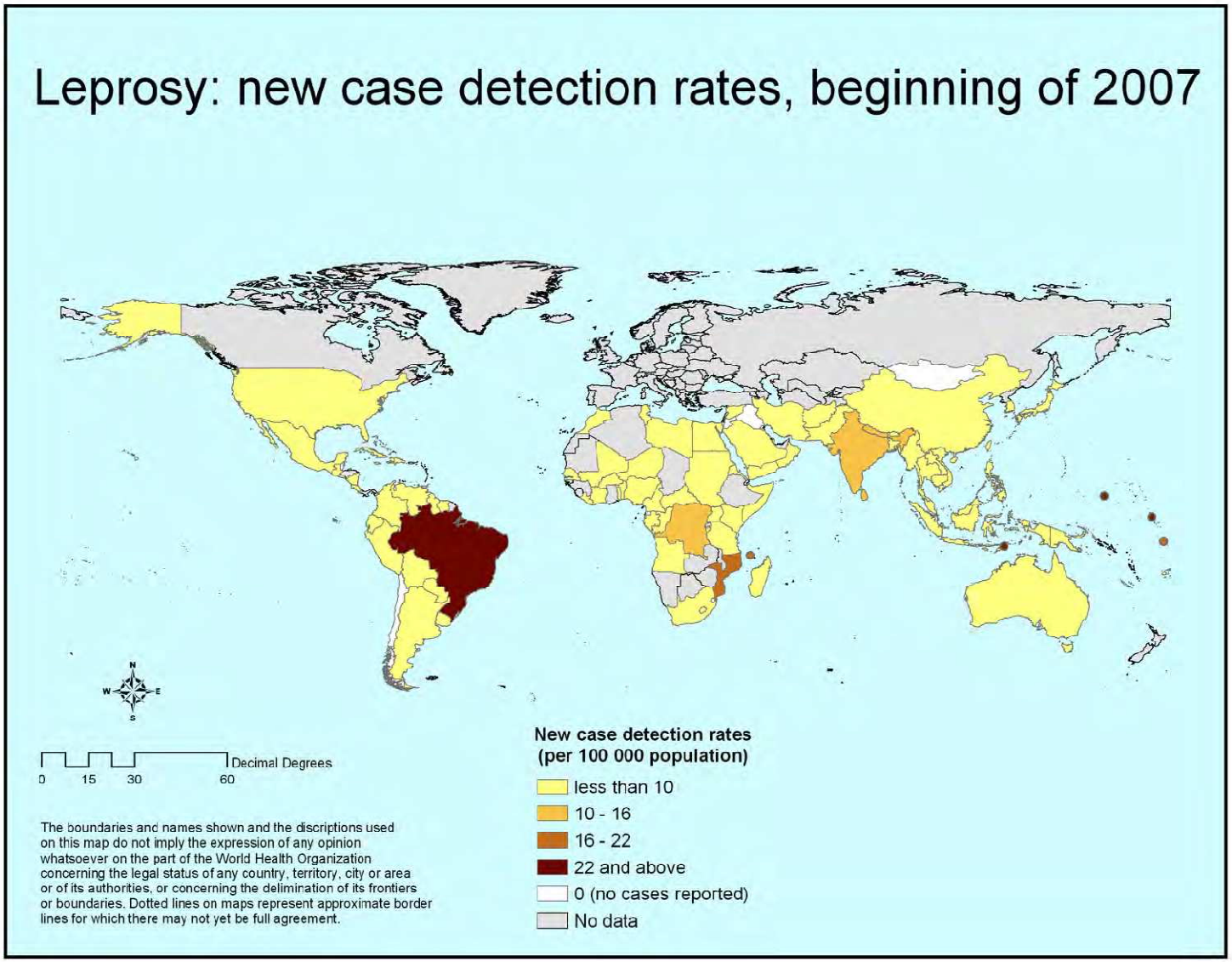

Epidemiological data

- According to official reports received during 2008 from 118 countries and territories, the global registered prevalence of leprosy at the beginning of 2008 stood at 212,802 cases, while the number of new cases detected during 2007 was 254,525 (excluding the small number of cases in Europe). The number of new cases detected globally has fallen by 11,100 cases (a 4% decrease) during 2007 compared with 2006.

Epidemiological data

- Most previously highly endemic countries have now reached elimination (defined as a registered prevalence rate of <1 case/10 000 population). During 2007, both the Democratic Republic of the Congo and Mozambique reached this important stage. Those few countries that remain are very close to eliminating the disease.
- However, pockets of high endemicity still remain in some areas of Angola, Brazil, Central African Republic, Democratic Republic of Congo, India, Madagascar, Mozambique, Nepal, and the ***United Republic of Tanzania***. These countries remain highly committed to eliminating the disease, and continue to intensify their leprosy control activities.

references

- Oxford Handbook of Clinical Medicine
- www.WHO.INT

Thank you