LEPROSY WEBINAR

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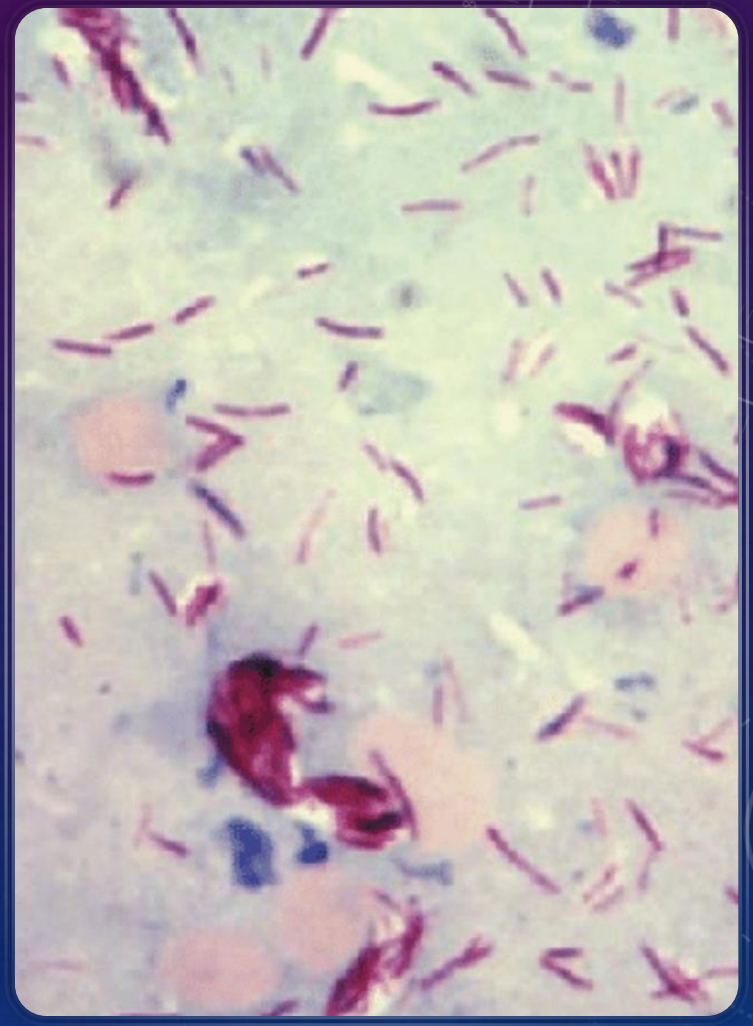
INTRODUCTION

- Leprosy, also known as Hansen's disease, is an infection due to Mycobacterium leprae (M. leprae) or M. lepromatosis .
- The infection is transmitted through droplet spread.
- It targets the skin, mucosal surfaces and the nervous system.
- It has a predilection for macrophages and nerves.
- The bacillus is weakly acid fast.
- It thrives best in temperatures below 30°C.
- The bacteria multiplication is very slow with incubation periods as long as two to ten years.
- M. leprae has not been cultured successfully in vitro but can be cultivated in armadillo footpads. (cannot be cultured)



EPIDEMIOLOGY-GLOBAL

- Important epidemiological indicators of disease burden in leprosy are new case detection rate and prevalence rate.
- In areas of high endemicity of leprosy, as seen in parts of India and Brazil, the new case detection rate and or prevalence rate are more than 10 cases per 100 000 inhabitants and one case per 10 000 inhabitants respectively.
- The highest incidence of the disease is found in India, Brazil and Indonesia (contributing 78 - 80% of global cases in 2016-2022).
- About 210 671 vs 174 087 new patients were reported globally in 2017 vs 2022, little change from 2014 statistics of more than 200 000 new patients globally.
- The number of new patients from India, which contributes 60 percent of global incidence, recorded 137 685, 135 485 and 103 819 for years 2007, 2016 and 2022 respectively with fewer cases during the pandemic

World Health Organization. Global leprosy update,2016: Accelerating reduction of disease burden. Wkly Epidemiol Rec 2017;92(35):501-519
World Health Organization. Global leprosy (Hansen disease) update, 2022: new paradigm – control to elimination. Wkly Epidemiol Rec 2022; 98 (37): 409-430
Fischer M. Leprosy – an overview of clinical features, diagnosis, and treatment. J Dtsch Dermatol Ges 2017;15(8):801-827
Muthuvel T, Isaakidis P, Shewade HD, Kattuppara L, Singh R, Govindarajulu S. Leprosy trends at a tertiary care hospital in Mumbai, India, from 2008 to 2015. Glob Health Action 2016;9(1):329

EPIDEMIOLOGY – AFRICA AND RSA

- From 2015 to 2022 Africa contributed 9 -12% of patients in the global leprosy incidence.
- The Democratic Republic of Congo, Ethiopia, Mozambique and Nigeria are the top four countries with the leprosy burden in Africa
- In South Africa (RSA) a decreasing trend of new leprosy patients has been observed from the late 1950s.
- IN RSA from 1921 to 1997 the leprosy prevalence remained less than one patient per 10 000 population.
- A mosaic distribution of leprosy in SA was noted from 1981 to 1991.New reported patients were clustered in Mpumalanga and northern KwaZulu-Natal.
- Following this period there is paucity of information on the trend of leprosy in RSA
- In 2015 there were 35 new reported patients of leprosy in SA, 20 of which were foreign born, no statistics are available for 2022

Durrheim DN, Fourie A, Balt E, Le Roux M, Harris BN, Matebula M, et al. Leprosy in Mpumalanga Province, South Africa--eliminated or hidden? Lepr Rev. 2002;73(4):3
WorldHealthOrganization.Globalleprosyupdate,2016:Acceleratingreductionofdiseaseburden.Wkly Epidemiol Rec 2017;92(35):501-519.
World Health Organization. Global leprosy (Hansen disease) update, 2022: new paradigm – control to elimination. Wkly Epidemiol Rec 2022; 98 (37): 409-430

DEMOGRAPHICS

- Women form the minority of reported leprosy patients worldwide ie 67 657 of 174 087 = 39% in 2022
- It is still unclear whether this is a true reflection of the actual disease profile or a late presentation.
- Various treatment centres have reported a high male to female ratio.
- Male predominance is thought to be due to late detection in female patients
- In Indonesia, women have preference for religious and spiritual healers which contributes to the late presentation

Price VG. Factors preventing early case detection for women affected by leprosy: A review of the literature. Glob Health Action 2017;10(Suppl 2):1360550
World Health Organization. Global leprosy (Hansen disease) update, 2022: new paradigm – control to elimination. Wkly Epidemiol Rec 2022; 98 (37): 409-430

DEMOGRAPHICS

- Mean age of presentation of 30.3±14.2 years.
- The numbers of children younger than 15 years infected with leprosy remain low worldwide ie 10 302 of 174 087 = 6% in 2022

Muthuvel T, Isaakidis P, Shewade HD, Kattuppara L, Singh R, Govindarajulu S. Leprosy trends at a tertiary care hospital in Mumbai, India, from 2008 to 2015. Glob Health Action 2016;9(1):32962
World Health Organization. Global leprosy (Hansen disease) update, 2022: new paradigm – control to elimination. Wkly Epidemiol Rec 2022; 98 (37): 409-430

CONTACT

- The single most important risk factor in the development of leprosy is close prolonged contact with a leprosy patient.
- This increases the risk by five to eight times.
- Contact-tracing has been used historically as a tool in detecting leprosy patients early.
- This method was used to diagnose patients in Ermelo District in SA.
- In Northern and Eastern Sudan, vigorous contact tracing of 3201 patients led to detection of 50 new patients between 2010 and 2016.
- A higher percentage (62%) of new leprosy patients has a family history of leprosy contact in a low endemic areas compared to a high endemic areas

Durrheim DN, Fourie A, Balt E, Le Roux M, Harris BN, Matebula M, et al. Leprosy in Mpumalanga Province, South Africa--eliminated or hidden? Lepr Rev. 2002;73(4):326-33.
Richardus JH, Meima A, van Marrewijk CJ, Croft RP, Smith TC. Close contacts with leprosy in newly diagnosed leprosy patients in a high and low endemic area: Comparison between Bangladesh and Thailand. Int J Lepr Other Mycobact Dis 2005;73(4):249-257.

RECENT PERSPECTIVE

Table 3. Baseline demographics (*N*=80)

Description	*n* (%)
Entry status	
New patients	70 (87.5)
Relapse after MDT	10 (12.5)
Gender	
Female	19 (23.8)
Male	61 (76.2)
Age group (years)	
<15	5 (6.2)
15 - 30	29 (36.2)
31 - 45	26 (32.5)
46 - 60	14 (17.5)
61 - 75	6 (7.5)
Region of origin	
Asia	6 (7.5)
Central Africa	5 (6.2)
Eastern Africa	8 (10.0)
Southern Africa	59 (73.8)
Western Africa	2 (2.5)
Contact history	
No	56 (70.0)
Yes	24 (30.0)

MDT = multidrug treatment.

Patterns of leprosy at Chris Hani Baragwanath Academic Hospital, Johannesburg, South Africa, and review of current clinical practice

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1999 to 2015

Table 4. Clinical spectrum (*N*=80)

Clinical spectrum	Description	*n* (%)
WHO classification	MB	71 (88.8)
	PB	9 (11.2)
Leprosy reaction	Type 1	9 (11.2)
	Type 2/ENL	21 (26.2)
	None	49 (61.2)
	Both type 1 and type 2	1 (1.2)
Neurological disability	Grade 0	19 (23.8)
	Grade 1	24 (30.0)
	Grade 2	37 (46.2)

WHO = World Health Organization; MB = multibacillary; PB = paucibacillary; ENL = erythema nodosum leprosum.

Southern African region = 59
SA born =44
Mozambique =10
Swaziland =2
Namibia = 1
Lesotho=1
Zambia=1

SA born =44
Gauteng =17
KZN=17
Mpumalanga=4
Limpopo =3
Free state=2
North West =1

CLASSIFICATION

- Leprosy presents as a spectrum of clinical variants which differ in shape, number and distribution of skin lesions.
- Skin patches may be anaesthetic, hypopigmented, or reddish in association with enlarged peripheral nerves.
- Sensory loss or weakness along the nerve supply may be found.
- Different classifications are used to differentiate between clinical variants.
- These include the widely used WHO operational classification, the Ridley and Jopling classification (RJC), the Madrid classification, and the classification describing the number of body areas affected by skin and neural lesions (NBAA).
- The WHO operational classification classifies patients with up to five skin lesions as paucibacillary (PB) and those with more than five lesions as multibacillary (MB). This classification is used to decide on patient's treatment
- New leprosy patients are predominantly MB
- In 2015 and 2016 the total proportion of MB patients worldwide was 59% to 60.2 %
- The MB forms correspond to lepromatous and borderline forms

CLASSIFICATION

Table 1. A summary of the World Health Organization classification of leprosy and treatment[3,15]

	Paucibacillary	Multibacillary
Number of lesions	1 - 5	>5
Symmetry	Asymmetrical	Symmetrical
Lesional anaesthesia	Always	Sometimes
Bacterial index	<2 at all sites	≥2 at any site
Treatment	6 months completed within 9 months	12 months completed within 18 months

CLASSIFICATION

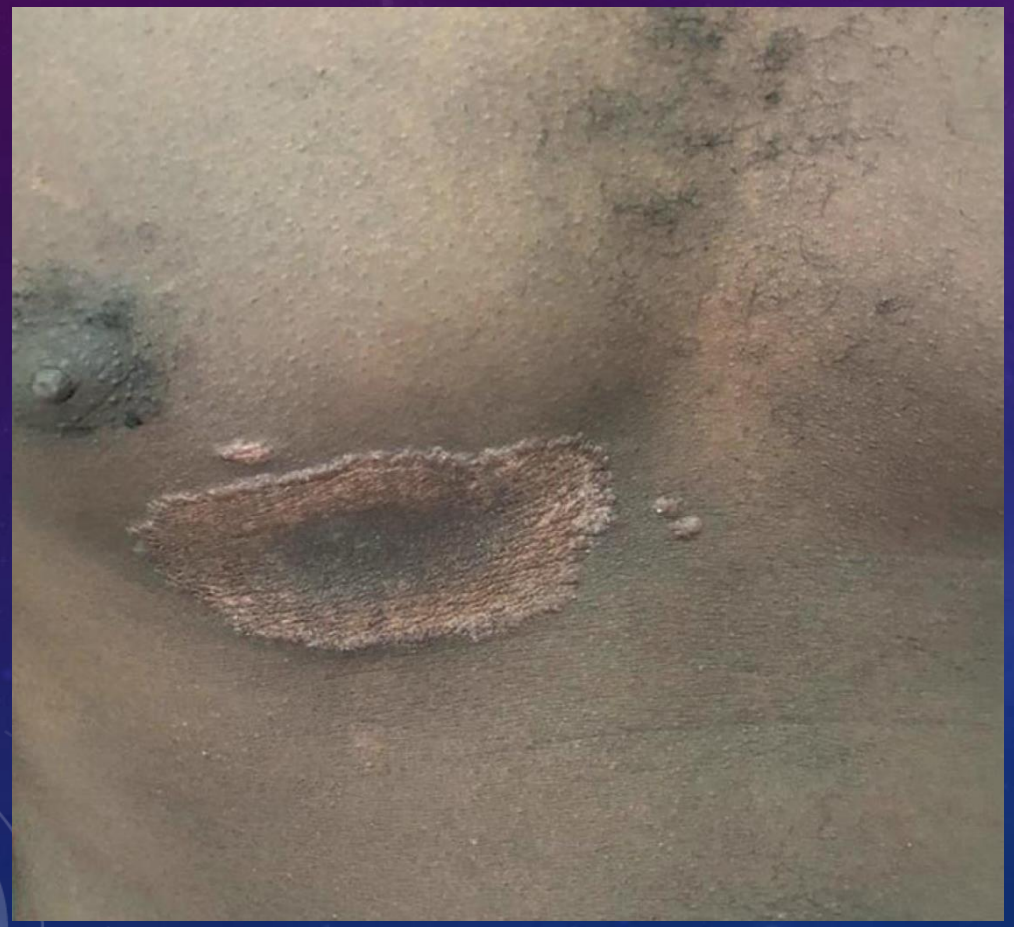
- The RJC divides the leprosy variants into two polar forms, tuberculoid leprosy (TT) and lepromatous leprosy (LL), as well as intermediate forms, which are subdivided into borderline tuberculoid leprosy (BT), midborderline leprosy (BB), and borderline lepromatous leprosy (BL)
- RJC is used mainly for research purposes
- In practice, these variants have overlapping clinical, immunological and histological features.
- The number of skin lesions increases from one to a few, in TT, to numerous and symmetrical towards the LL.
- Indeterminate leprosy presents as a single or multiple hypopigmented macules with no infiltration, erythema, anaesthesia or nerve thickening

CLASSIFICATION

Table 2. A summary of clinical features of leprosy based on the Ridley-Jopling classification[15,16,19,20]

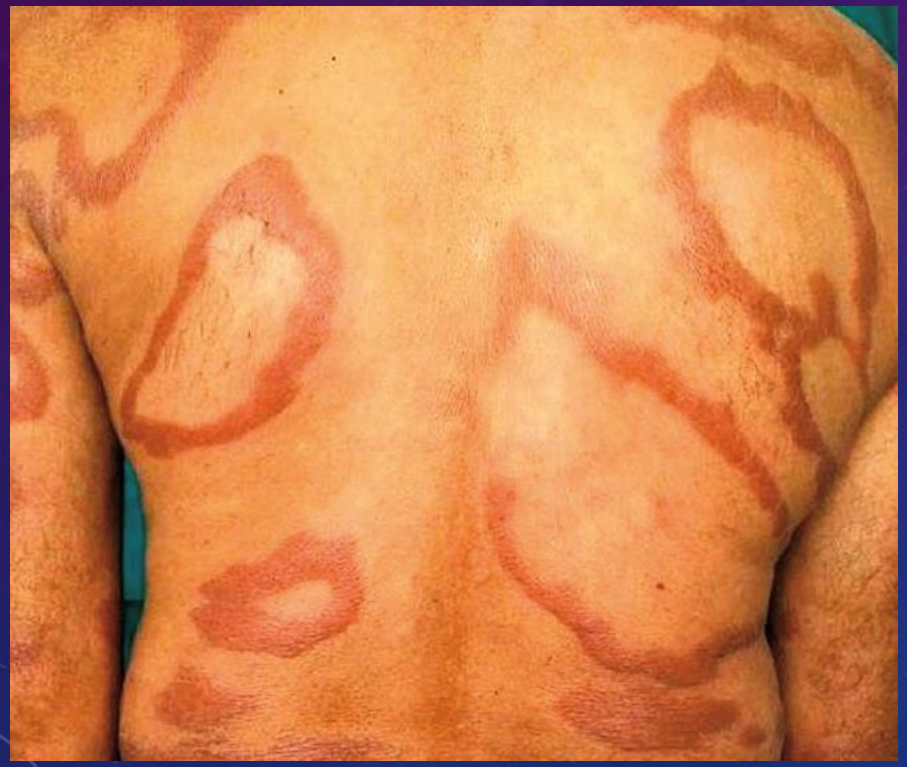
	Tuberculoid	Borderline tuberculoid	Borderline borderline	Borderline lepromatous	Lepromatous
Number of lesions	1 - 3 asymmetrical	≥4 asymmetrical	Few to many (countable)	Too many to count, symmetrical	Numerous symmetrical
Skin lesions	Well defined; large hypopigmented or erythematous; patch or plaques; hairless, dry	Well defined; smaller macules or plaques; satellite lesions	Irregular shapes; variable sizes macules or plaques	Hypopigmented or erythematous; patches, plaques or nodules; ill-defined borders	Hypopigmented or erythematous; patches, plaques or nodules; ill-defined borders
Nerves	1 or 2 enlarged	Few; asymmetrically enlarged	Numerous; may be symmetrically enlarged	Numerous; may be symmetrically enlarged	Numerous; symmetrically enlarged
Sensation over lesions	None	Reduced	May or may not be reduced	May or may not be reduced	Normal
Bacilli on smear	Few	May or may not be seen	May or may not be seen	Numerous	Numerous
Immunity	High	Unstable immune responses able to migrate either way			Low

TUBERCULOID LEPROSY



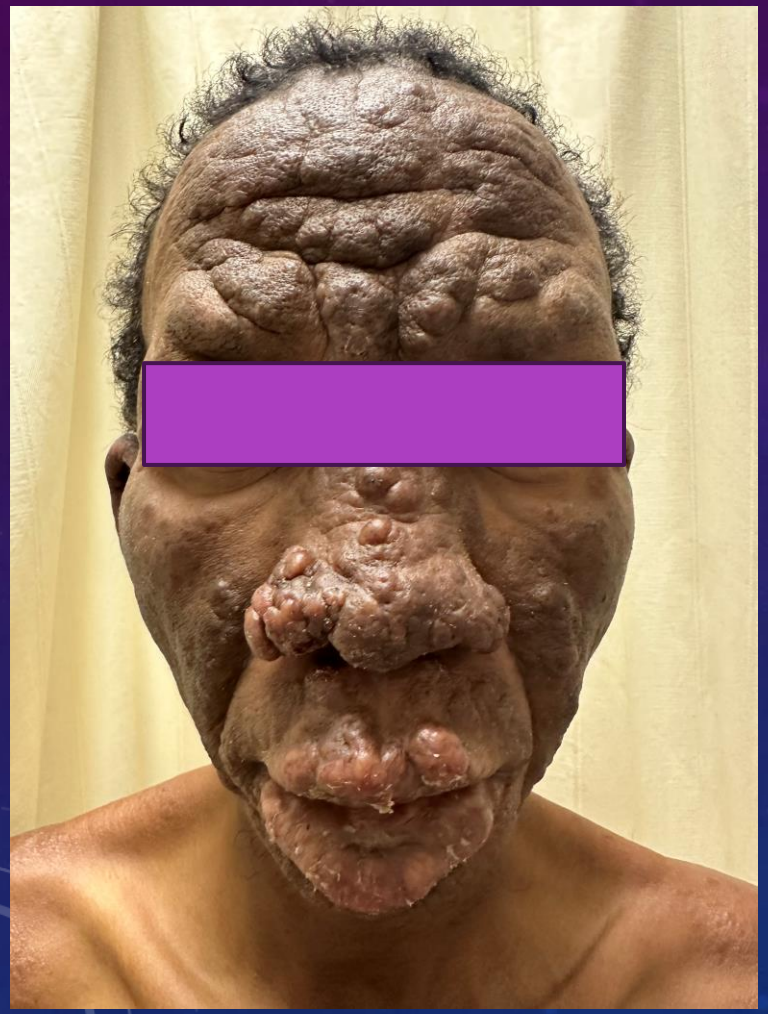
Solitary to few <5
Hypopigmented/erythematous
Dry/scaly
Hairless
Large
Sharply defined
Elevated border slopping to flattened atrophic centre
‘saucer right side up’ appearance

MID BORDERLINE LEPROSY



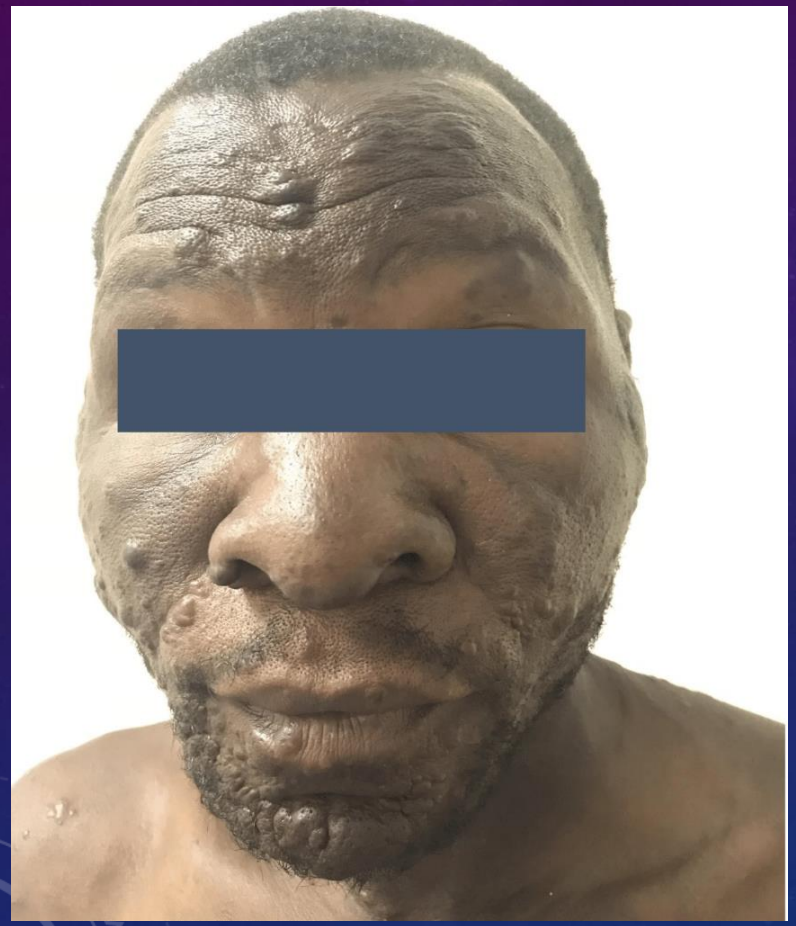
Many countable
Red irregular shaped plaques
Small satellite lesions surround larger ones
Generalized, asymmetrical

LEPROMATOUS LEPROSY



Lepromatous infiltrations
Diffused plaques
infiltrations of face esp forehead
Madarosis (loss of eyebrows)
Waxy /shiny apperance
Nodular type
Nodules = lepromas on ears, brows, nose

LEPROMATOUS LEPROSY



Histiod subtype
Papules and nodules on background of normal skin