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FILARIASIS

OUTLINE OF PRESENTATION

- Identification
- Infectious agent
- Occurrence
- Reservoir
- Mode of transmission
- Incubation period
- Period of communicability
- Susceptibility
- Methods of control

INTRODUCTION

- Lymphatic filariasis, commonly known as elephantiasis, is *a neglected tropical disease*.
- Infection is usually acquired in childhood causing hidden damage to the lymphatic system.
- The painful and profoundly disfiguring visible manifestations of the disease, lymphoedema, elephantiasis and scrotal swelling occur later in life and lead to permanent disability.
- **These patients are not only physically disabled, but suffer** *mental, social and financial losses* **contributing to stigma and poverty.**

IDENTIFICATION

Clinical Manifestations:

Lymphatic Filariasis :-

a. Asymptomatic **amicrofilaraemia**

b. Asyptomatic **Microfilaraemia** - carriers

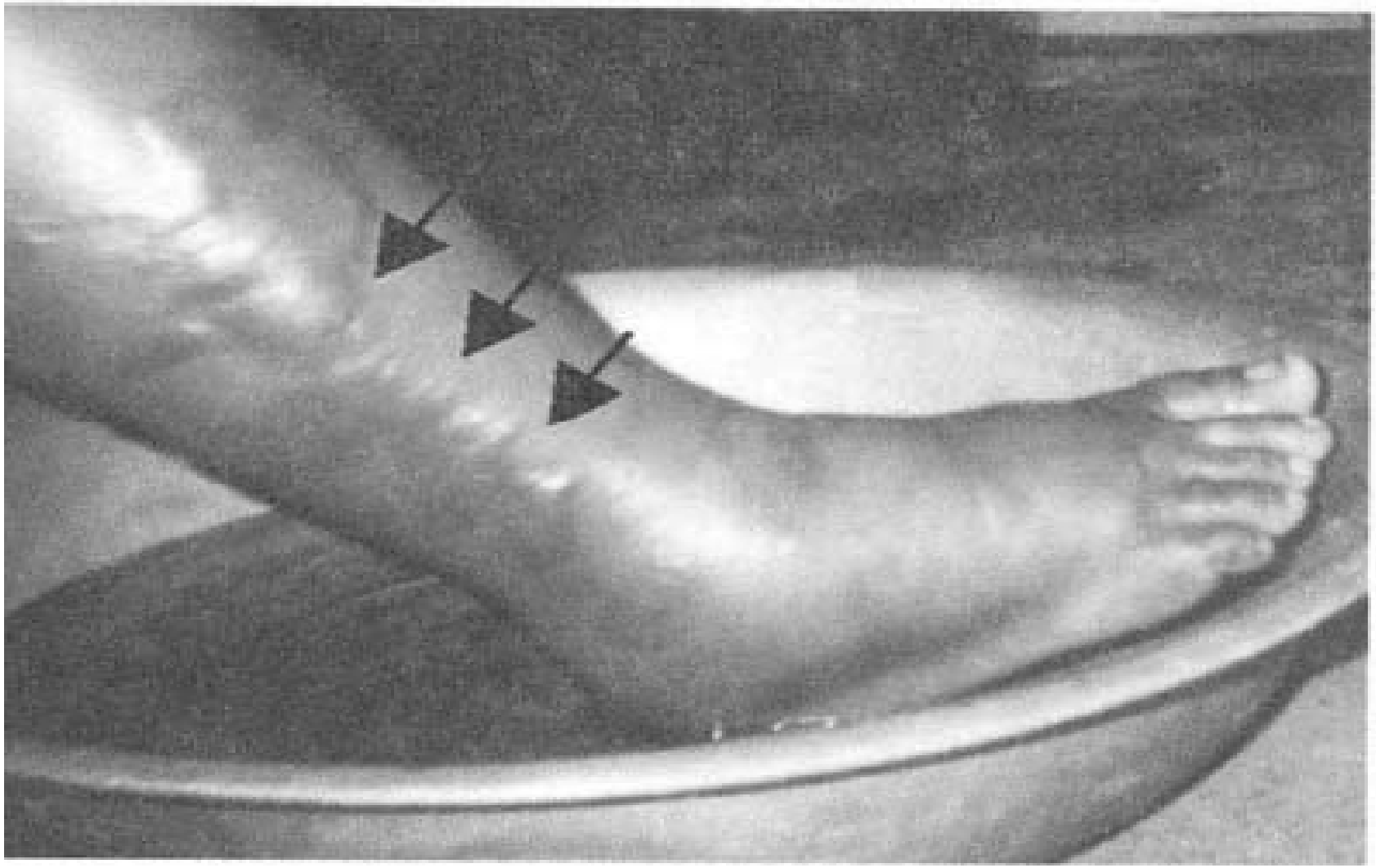
c. **Acute** recurrent filarial fever, lymphadenitis, lymphenigitis, epididimoorchitis (♂)

d. **Chronic** manifestation – 10-15 yrs after acute attack, fibrosis - hydrocoele, chyluria, elephantiasis of limbs, breast and genitalia, *permanent deformity.*

Occult Filariasis. :

- No classical manifestation
- No Microfilaraemia in blood
- hypersensitivity reaction- *tropical eosinophilia*, paroxysmal noctural asthma, Chr. interstitial lung disease & *degenerating MF in tissues not in PBF*.

Acute Dermatolymphangioadenitis



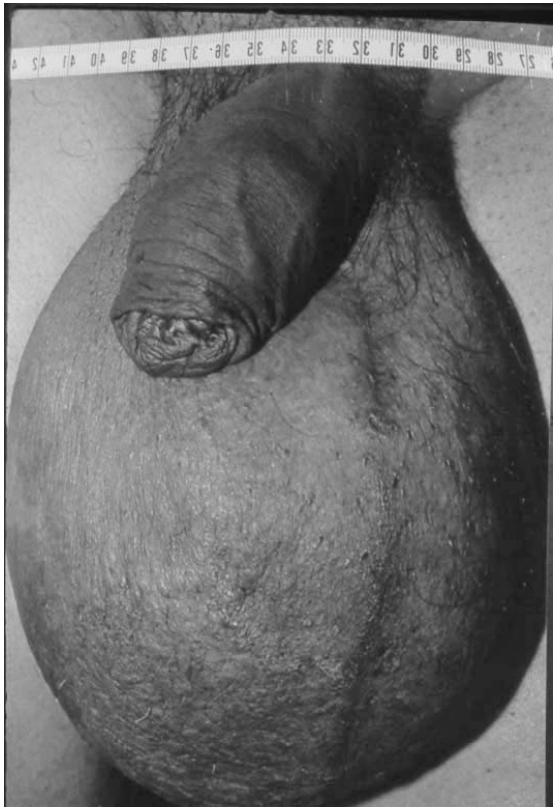
Leg swelling

Recurrent “attacks”

Loss of wages

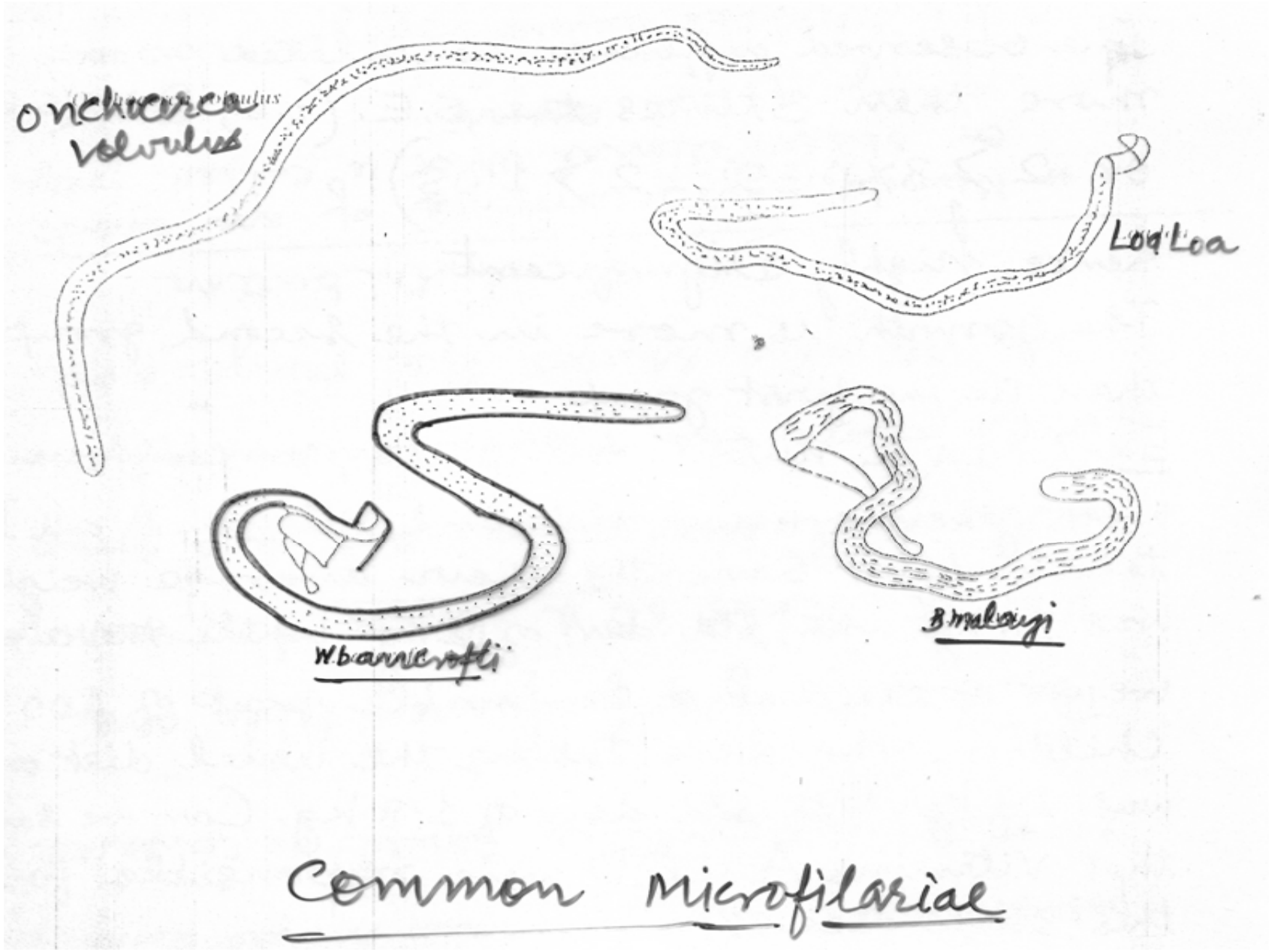
Unable to participate in social functions

HYDROCELE



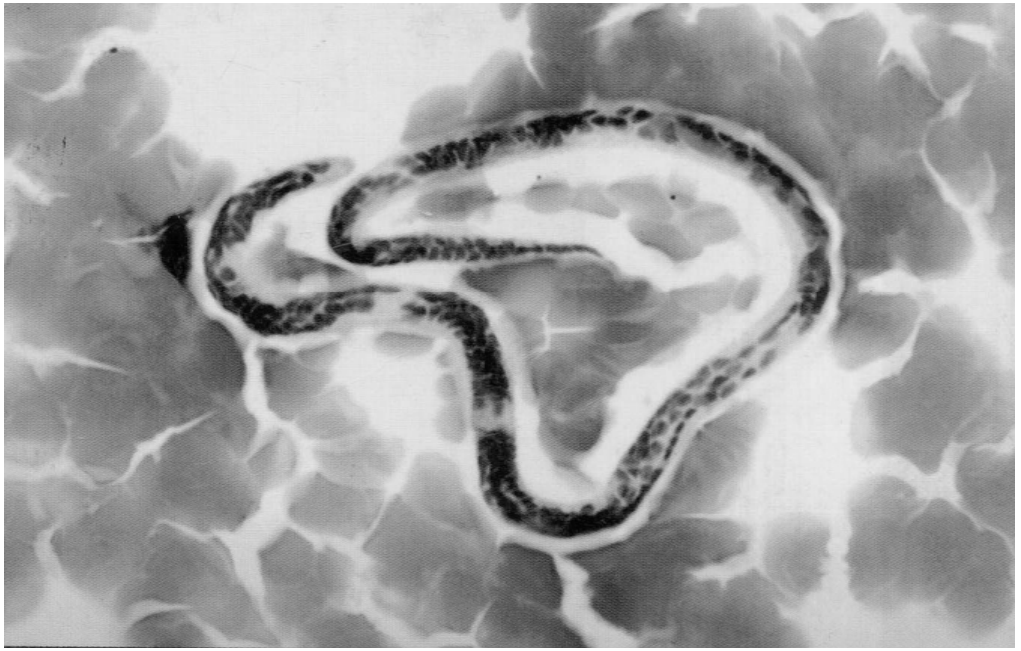
INFECTIOUS AGENT

- Filariasis is caused by the nematode worm, either *Wuchereria bancrofti* or *Brugia malayi*
- round, coiled and thread-like parasitic worms belonging to the family filaridea.
- In India, 99.4% of the cases are caused by the species - Wuchereria bancrofti whereas Brugia malayi is responsible for 0.6% of the problem.



Common Microfilariae

Blood smear: Micofilaria



Blood smear
Concentration methods
Nuclepore filtration technique - advantages

TABLE 1
HUMAN FILARIAL INFECTIONS

Organism	Vectors	Disease produced
Wuchereria bancrofti	Culex Mosquitoes	Lymphatic filariasis
Brugia malayi	Mansonia Mosquitoes	Lymphatic filariasis
Brugia timori	Anopheles mosquitoes Mansonia mosquitoes	Lymphatic filariasis
Onchocerca volvulus	Simulum flies	Subcutaneous nodules;River blindness

TABLE 1
HUMAN FILARIAL INFECTIONS

Organism	Vectors	Disease produced
Loa Loa	Chrysopes flies	Recurrent, transient subcutaneous swellings
T.Perstans	Culicoides	Probably rarely any clinical illness
T.Streptocerca	Culicoides	Probably rarely any clinical illness
Monsonella ozzardi	Culicoides	Probably rarely any clinical illness

TABLE 2
DIFFERENCE BETWEEN MF OF W.BANCROFTI AND B.MALAYI

	Mf.(W.bancrofti)	**Mf.(B malayi)**
General Appearance	Graceful, Sweeping curves	Crinkled, secondary curves
Length	244u to 296u	177u to 230u
Fee cephalic space	As long as broad	Nearly twice as long as broad
Excretory pore	Not prominent	Prominent

TABLE 2
DIFFERENCE BETWEEN MF OF W.BANCROFTI AND B.MALAYI

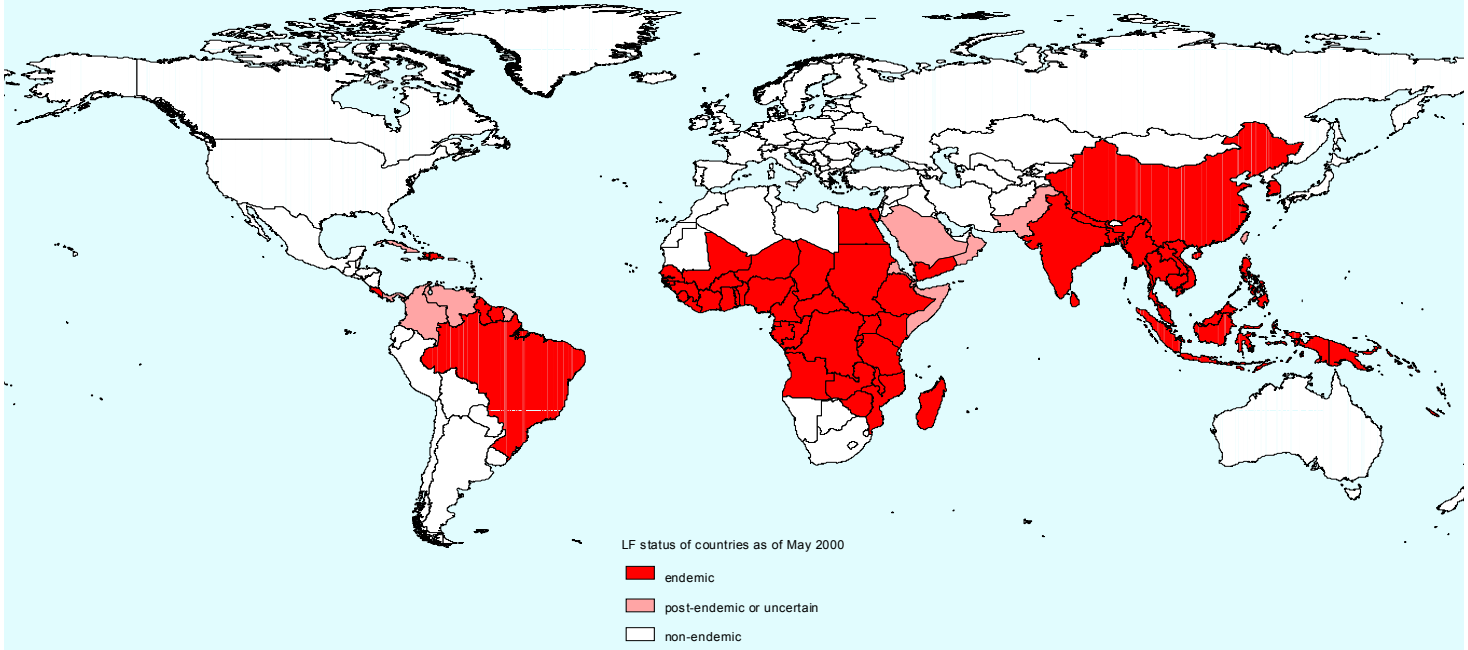
	Mf.(W.bancrofti)	**Mf.(B malayi)**
Caudal end	Uniformly tapering to a delicate point, no terminal nuclei present	Kinkled and two terminal nuclei present
Nuclear column	Nuclei discrete	smudged

OCCURRENCE: GLOBAL BURDEN

- Currently, more than 1.4 billion people in 83 countries are *at risk of being infected.*

- Approximately 80% of these people are living in *10 countries*:
  - Bangladesh, Democratic Republic of Congo, Ethiopia, India, Indonesia, Myanmar, Nigeria, Nepal, Philippines and the United Republic of Tanzania.

Countries with lymphatic filariasis



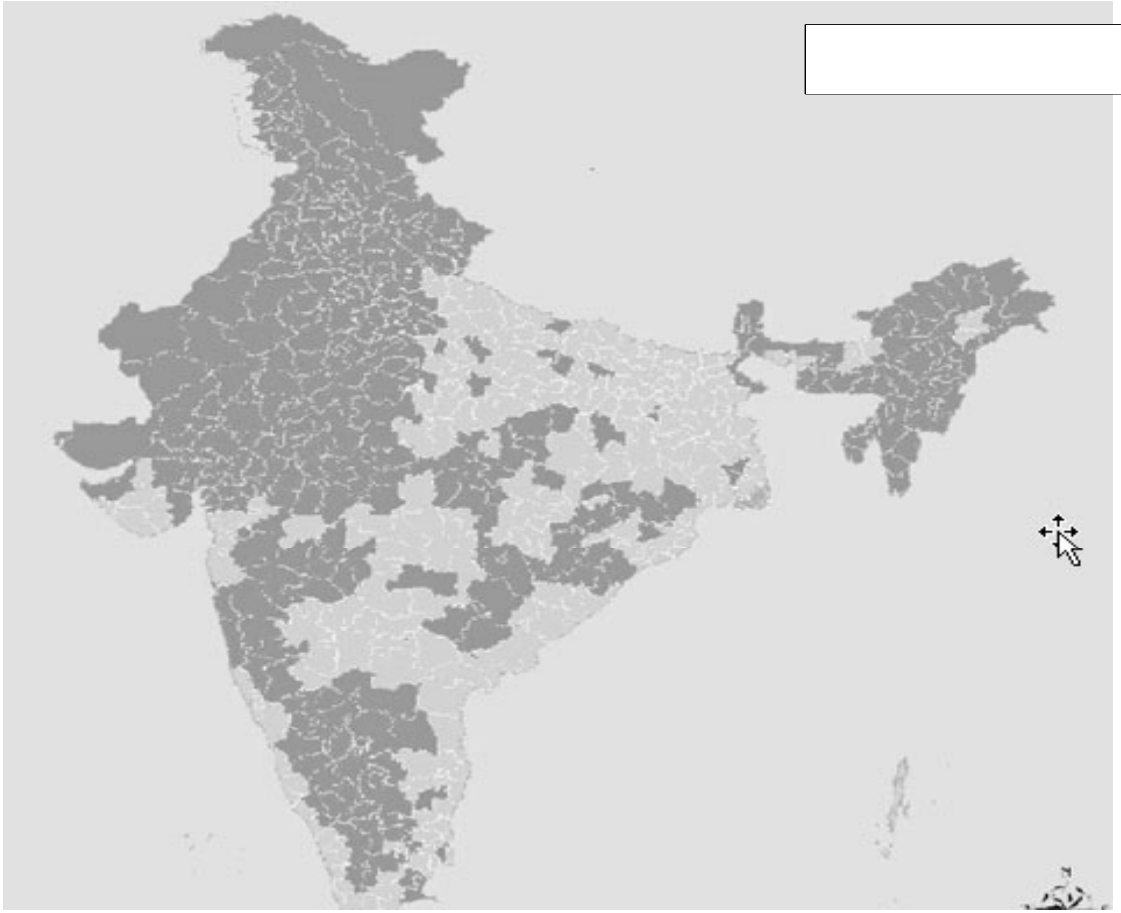
World Health Organization
Global Programme for Elimination of Lymhatic Filariasis

- Globally, an estimated 25 million men suffer with genital disease and over 15 million people are afflicted with lymphoedema.

- Eliminating lymphatic filariasis can *prevent unnecessary suffering and contribute to the reduction of poverty (WHO March 2014)*

INDIAN SCENARIO

INDIGENOUS CASES HAVE BEEN REPORTED FROM ABOUT 250 DISTRICTS IN 20 STATES/UNION TERRITORIES.



- 600 million are living in endemic areas

  (450 in rural areas + 150 in urban areas)
- 31 million microfilaria carriers
- 23 million filaria disease cases
- India contributes 38% of LF problem in the world and more than 70% in SEA Region

(2008 statistics)

- **Filariasis** has been a *major public health problem* in India next only to malaria.
- The disease was recorded in India as early as 6th century B.C. by the famous Indian physician, Susruta in his book **Susruta Samhita**.
- In 7th century A.D., **Madhavakara** described signs and symptoms of the disease in his treatise 'Madhava Nidhana' which hold good even today.
- In 1709, Clarke called elephantoid legs in Cochin as **Malabar legs**.
- The **discovery** of microfilariae (mf) in the peripheral blood was made first by **Lewis in 1872** in Calcutta (Kolkata).

PERIODICITY

- Nocturnal periodicity
- *10 pm – 2 am* : Maximal density of Mf in blood
- Reversal of periodicity
- Non-periodic: Mf detected through out the day In south pacific islands and limited areas of Nicobar island, Thailand and Vietnam

RESERVOIR

Animal Reservoir

- No -- W.b.
- Yes -- B.m. i.e. monkey,cats,dogs

HOST

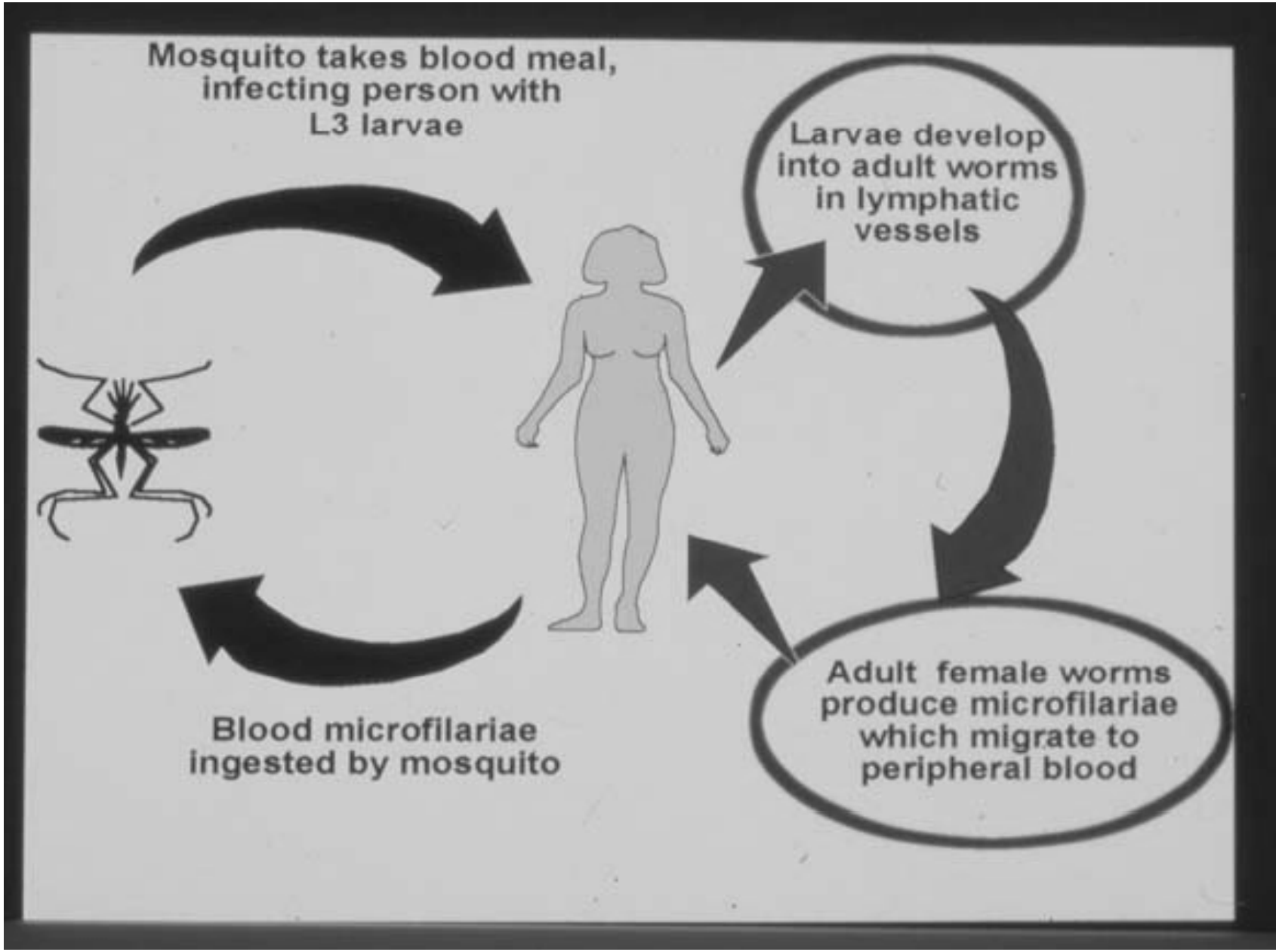
- Man is a natural host.
- Age: all ages are susceptible.
- Gender: Male > Female
- Migration facilitate spreads to non-endemic areas.
- Immunity develops after many years of exposure.
- Social factors: *urbanization, industrialization, migration, illiteracy, poverty, poor sanitation.*

ENVIRONMENTAL FACTORS

- Climate favoring vector
- Temperature :22-38 deg
- 70% relative humidity
- Poor Drainage, poor sewage disposal, lack of town planning
- Common breeding places: cesspool, soakage pits, ill maintained drains, septic tanks, open ditches etc.

MODE OF TRANSMISSION

- Transmitted by the bite of infected vector mosquito
- These parasites after getting deposited on skin penetrate on their own or through the opening created by mosquito bites to reach the lymphatic system.
- Dynamics of transmission depends upon *infective biting rate.*


Mosquito takes blood meal, infecting person with L3 larvae
Larvae develop into adult worms in lymphatic vessels
Adult female worms produce microfilariae which migrate to peripheral blood
Blood microfilariae ingested by mosquito

Incubation Period :

- Pre patent period – Not Known.
- Clinical incubation period (08m-16m)

Period of Communicability:

- Not directly person to person
- Man – infective if MF+
- Mosquito – infective after 10 days.

SUSCEPTIBILITY

- Universal but considerable geographic difference in the type & severity of disease, *repeated infection in endemic region lead to severe manifestation as Elephantiasis.*

ECONOMIC BURDEN

- Loss of human days
- Loss of productivity
- Loss of wages
- Annual loss to India US $ 1.5 billion
- Cost for DEC implementation Rs 1
- Total 5 yr investment US 12 million
- Less than 1% of burden

Sexual disability

MANAGEMENT

- Home based management
- Treatment for *uncomplicated ADLA*
  - Antibiotic, analgesic and supportive measures
  - No anti-filarial medicine.
- Treatment for *complicated ADLA*
  - IV Antibiotics, analgesics, antipyretics
  - No anti-filarial medicine.
- Hydrocele management: Surgery

ADLA: Acute Dermato Lymphangio Adenitis

FILARIAL SURVEYS

a. Mass blood surveys

   Thick film

   Membrane Filter Concentration

   DEC Provocation test

b. Clinical Survey

c. Serological tests

d. Xenodiagnosis

e. Entomological Survey

METHODS OF CONTROL

- Chemotherapy
- Vector control

SPECIFIC TREATMENT

a. *Individual*

i) DEC – Diethyl Carbamazine – safe, effective

06mg/kg orally x 12 days

may produce toxic reactions

a. due to drugs

b. due to worms

better to give in spaced doses

b. Community Level:

i. Mass Therapy- not recommended

ii. Selective treatment- 06 mg/kg x 12 days (2 wks)

to repeat after 02 yrs

- inadequate clearance
- reinfection

iii. DEC Medicated Salt : Mf Carriers only

01-04 gm DEC/kg x 06 – 09 m

Safe cheap and effective

iv) Ivermectin - 20-400 ug / kg (weeks)

recurrance by 03m

geometric mean 06m.

Vector Control

- Antilarval measures
  - .Chemical control
  - .Removal of Pistia plant
  - .Minor environmental measures
- Antiadult measures – not very effective
- Personal prophylaxis

Public Education

Long term control

- WHO launched its Global Programme to Eliminate Lymphatic Filariasis (GPELF) in 2000 with the aim of eliminating the disease as a public-health problem. In 2012, the WHO NTD Roadmap reconfirmed the target date for achieving elimination by 2020.
- WHO's strategy is based on 2 key components:
- stopping transmission through *large-scale annual treatment of all eligible people in an area or region where infection is present;*
- alleviating the suffering caused by lymphatic filariasis through *increased morbidity management and disability prevention activities*

THANK YOU