RAMA UNIVERSITY

www.ramauniversity.ac.in

FACULTY OF NURSING

PIDEMIOLOGY OF UBERCULOSIS

Mrs. Namita Batra Guin
Associate Professor

TUBERCULOSIS

Tuberculosis is a specific respiratory disease caused by M. tuberculosis.

The disease primarily affects lungs and causes pulmonary tuberculosis.

It can also affect intestine, meninges, bones and joints, lymph glands, skin and other tissues of the body.

The disease is usually chronic with varying clinical manifestations.

EPIDEMIOLOGICAL DETERMINANTS

AGENT FACTORS

M. tuberculosis is a facultative intracellular parasite.(readily ingested by phagocytes and is resistant to intracellular killing).

It is an acid fast, gram positive, rod shaped bacilli.

SOURCE OF INFECTION

- There are two sources of infection- human and bovine.

- HUMAN SOURCE : The most common source of infection is the human case whose sputum is positive for tubercle bacilli, who has not received treatment or not treated fully.

COMMUNICABILITY

- Patients are infective as long as they remain untreated.

- Effective antimicrobial treatment reduces infectivity by 90% within 48 hours.

HOST FACTORS

Tuberculosis affects all ages.
TB is more prevalent in males than in females.
Tuberculosis is not a hereditary disease.
Malnutrition(under nutrition) is widely believed to predispose TB.
Man has no inherited immunity against TB.
It is acquired as a result of natural infection or BCG vaccination.

ENVIRONMENTAL FACTORS

- The social factors include factors such as poor quality of life, poor housing, overcrowding, population explosion, under nutrition, lack of education, large families, lack of awareness of cause of illness.

MODE OF TRANSMISSION

- TB is transmitted through droplet infection and droplet nuclei generated by sputum positive patients with pulmonary TB.

INCUBATION PERIOD

- Ranges from 3 to 6 weeks, and thereafter the disease depends upon the closeness of contact, extent of the disease and sputum positivity of the source case (dose of infection) and host parasite relationship.

- Thus the incubation period in the real sense may extend to weeks, months or years.

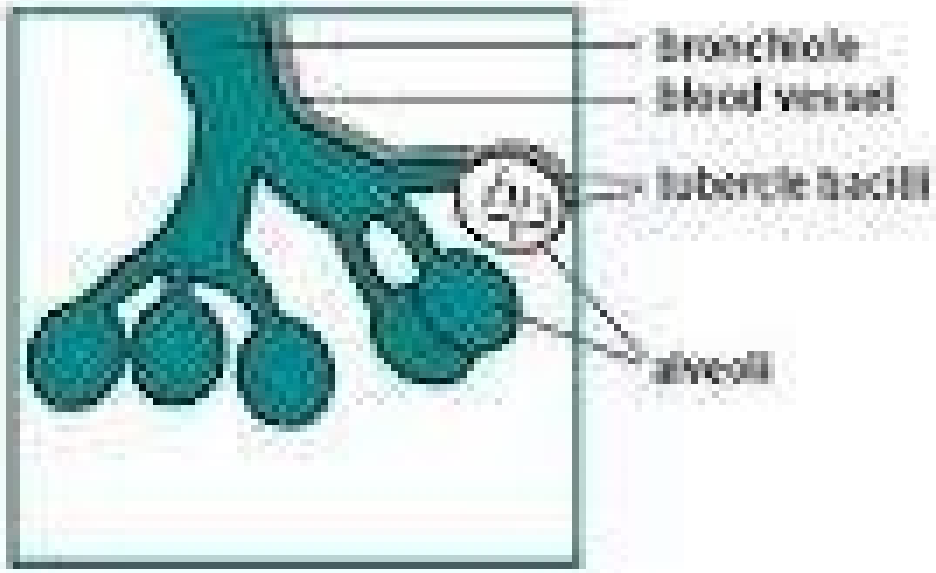
TB Pathogenesis (4)

1

Droplet nuclei containing tubercle bacilli are inhaled, enter the lungs, and travel to small air sacs (alveoli)

TB Pathogenesis (5)

2



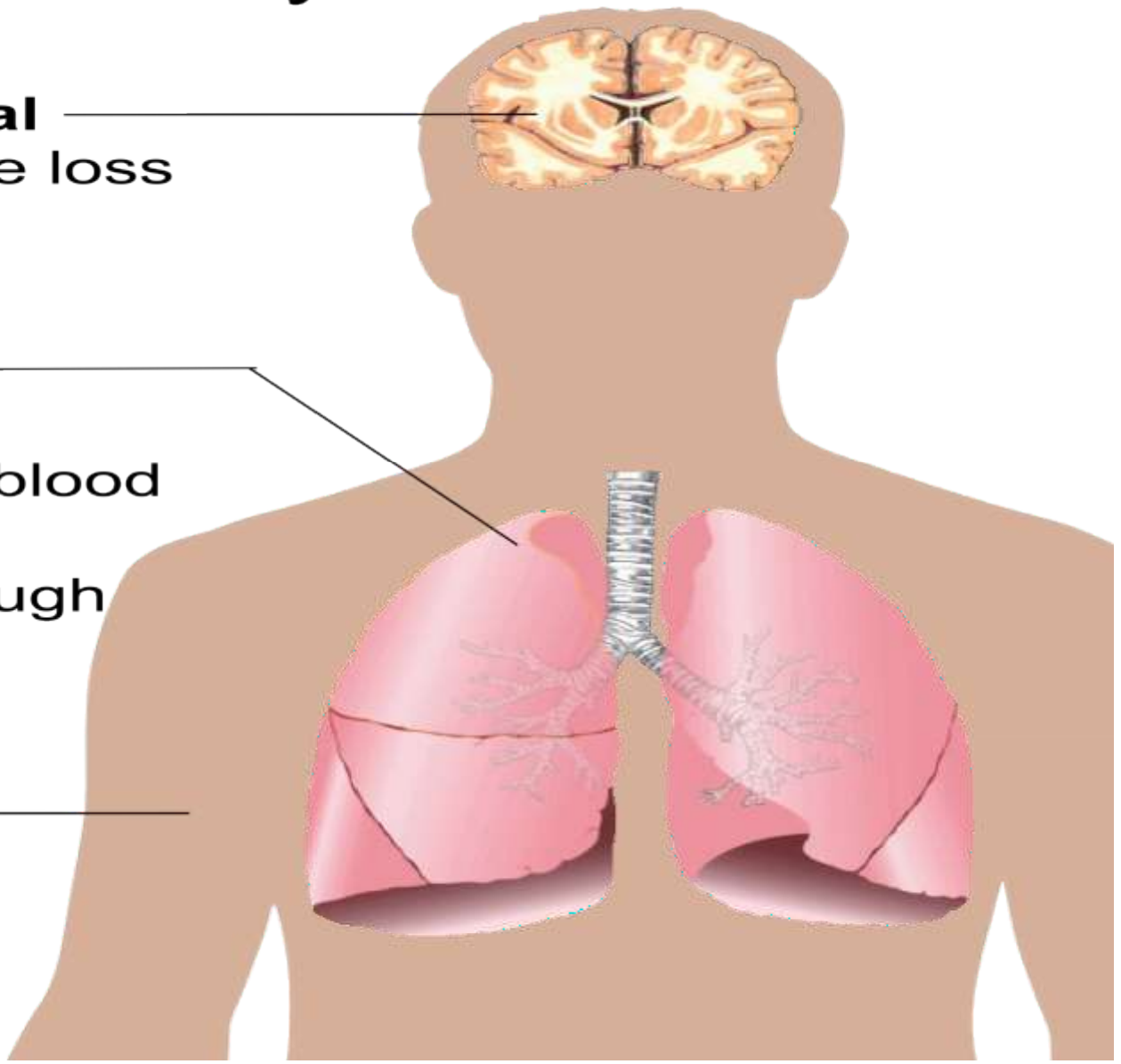
Tubercle bacilli multiply in alveoli, where infection begins

Main symptoms of Pulmonary tuberculosis

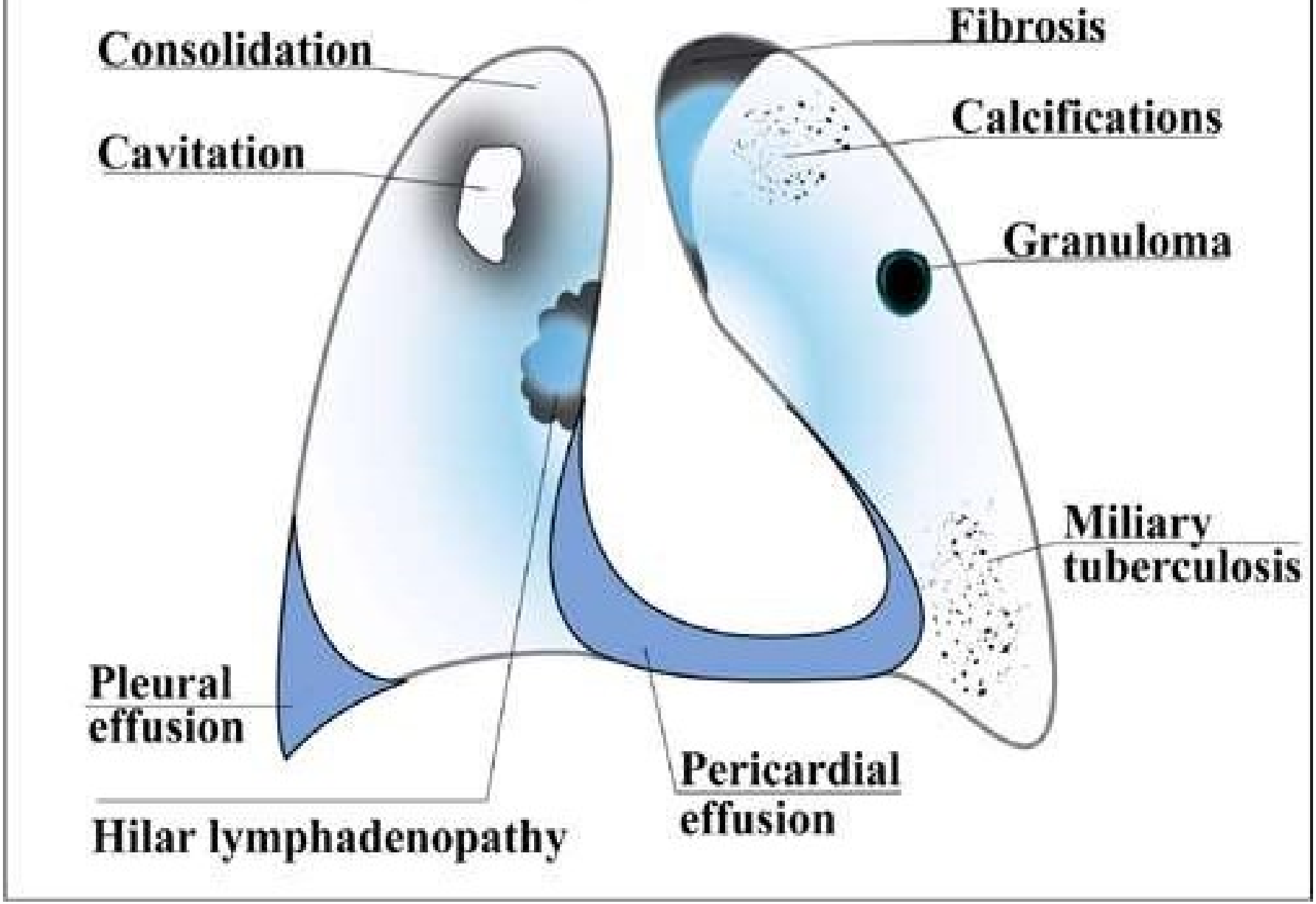
Central
- appetite loss
- fatigue

Lungs
- chest pain
- coughing up blood
- productive, prolonged cough

Skin
- night sweats,
- pallor



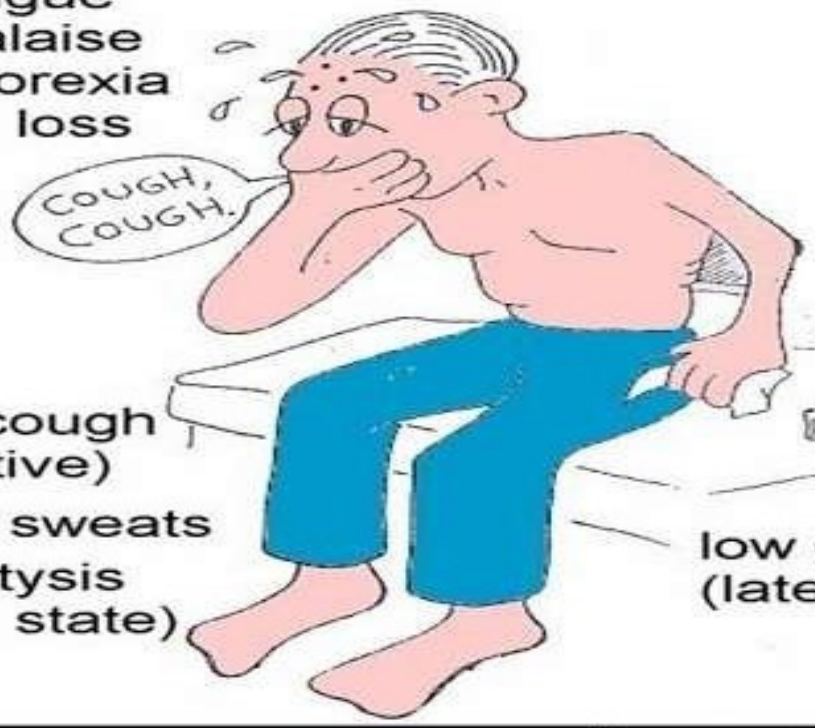
Manifestations of tuberculosis

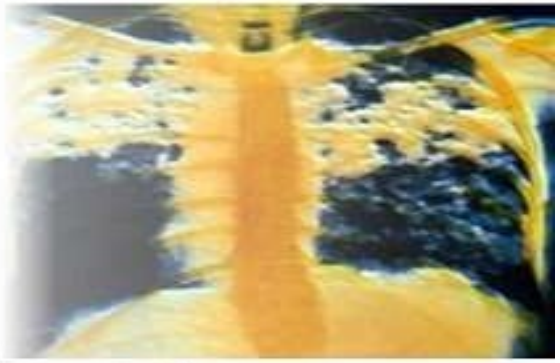


CLINICAL

TUBERCULOSIS (TB)

- fatigue
- malaise
- anorexia
- wt. loss





chronic cough (productive)

night sweats

hemoptysis (advaced state)

low grade temp. (late afternoon)

Treatment:	Diagnostic:
TB medications 6 to 12 months bedrest until sypmtoms resp isolation until negative sputum frequently out-pt basis	TB skin test chest x-ray bacteriologic sputum studies

CONTROL OF TB

CASE FINDING

- The first step in a tuberculosis control programme is early detection of sputum positive cases.

- This must be done as an intensified ongoing programme.

CASE DEFINITION

- WHO defines a case as “a patient whose sputum is positive for tubercle bacilli, and such cases are the target of case finding.

CASE FINDING TOOLS

1. SPUTUM EXAMINATION.
2. RADIOGRAPHY.
3. SPUTUM CULTURE.

SPUTUM EXAMINATION

- Sputum smear examination is considered as the method of choice.

- The tool is reliable and cheap.

In practice an out patient usually provides sputum sample as follows.

DAY 1	SAMPLE 1	PROVIDES AN "ON THE SPOT" SAMPLE UNDER SUPERVISION WHEN PRESENTING TO THE HEALTH FACILITY. GIVE THE PATIENT A SPUTUM CONTAINER TO TAKE HOME FOR AN EARLY MORNING SAMPLE FO THE FOLLOWING MORNING.

DAY 2	SAMPLE 2	PATIENT BRINGS AN EARLY MORNING SAMPLE.

- Sputum smear microscopy for tubercle bacilli is positive when there are at least 10,000 organisms present per ml of sputum.

- One positive specimen out of the two is enough to declare a patient smear positive.
- Patients in whom both specimens are smear negative should be prescribed symptomatic treatment and broad spectrum antibiotic for 10-14 days.

- In such cases antibiotics such as FLUOROQUINOLONES (ciprofloxacin, ofloxacin), rifampicin or streptomycin, which are active against TB should not be used.

RADIOGRAPHY

- Chest X rays are useful for the diagnosis of smear negative PTB and TB in children.

- It is essential in the diagnosis of miliary TB.

SPUTUM CULTURE

- Culture examination of sputum is only second importance in case finding programme.

- It takes 6 to 8 weeks for sputum culture.

DRUG SENSITIVITY TESTING(DST)

- DST provides a definitive diagnosis of drug-resistant TB.

TUBERCULIN TEST

- Tuberculin test was discovered by Von Pirquet in 1907.

- A positive reaction to the test is generally accepted as evidence or past or present infection by M.tubercolosis.

- Tuberculin test is the only means of estimating the prevalence of infection in the population.

- Tuberculin reaction consists of erythema and induration.

- Since erythema is difficult to measure induration alone is measured using a transparent plastic ruler or callipers).

Reaction exceeding 10mm are considered “positive”.

Those less than 6 mm are considered negative.

Those between 6 and 9 mm are considered “doubtful”

TREATMENT

WHO – Approved Fixed – Dose combinations of Anti tuberculosis drugs

Isoniazid	150 mg	+	Ethambutol 400 mg
Rifampin	60 mg	+	Isoniazid 30 mg
	150 mg	+	75 mg
	300 mg	+	150 mg
	60 mg	+	60 mg } For Intermittent use
	150 mg	+	150 mg

Rifampin	+	Isoniazid	+	Pyrazinamide	
60 mg		30 mg	+	150 mg	
150 mg	+	75 mg	+	400 mg	
150 mg	+	150 mg	+	500 mg	For Intermittent use

Rifampicin + Isoniazid + Pyrazinamide + Ethambutol
150 mg + 75 mg + 400 mg + 275 mg

BACTERICIDAL DRUGS	BACTERIOST ATIC DRUGS
1.Rifampicin (RMP).	1. Ethambutol.
2. INH.	2. Thiacetazone.
3. Strptomycin.	
4. Pyrazinamide.	

THE SECOND LINE DRUGS

- Fluoroquinalones.
- Ethionamide.
- Capreomycin.
- Kanamycin and Amikacin.
- Cycloserine.
- Macrolides.

DOSAGE FOR ADULTS

WHO RECOMMENDED TREATMENT REGIMEN-TUBERCULOSIS

CATEGORY OF TREATMENT	TYPE OF PATIENT	REGIMEN
Category I	New sputum smear positive	$2(HRZE)_3$, $4(HR)_3$
	Seriously ill sputum smear negative Seriously ill extra-pulmonary	

TEGORY OF REATMENT	TYPE OF PATIENT	REGIMEN
tegory II	Sputum smear-positive relapse	$2(HRZES)_3$ $1(HRZE)_3$
	Sputum smear-positive failure	$5(HRE)_3$
	Sputum smear-positive treatment after default	

- Patient who weight more than 60kg receive additional rifampicin 150mg.

- patient more than 50years old receive Streptomycin 500mg.

DOSAGE FOR CHILDREN

DRUG	THERAPHY per DOSE (THRICE A WEEK)
ISONIAZID	10-15 mg/kg
RIFAMPICIN	10 mg/kg

DRUG	THERAPHY per DOSE (THRICE A WEEK)
PYRAZINAMIDE	35 mg/kg
STREPTOMYCIN	15 mg/kg
ETHAMBUTOL	30 mg/kg

- ETHAMBUTOL should not be given to children below 6 years of age.

- A patient who develops one of the afore said reactions must never receive that drug again.

PREVENTION

BCG vaccination which was firs
developed was known as bacill
Calmette Guerin.

The vaccine should be administered a
birth

The site of injection should be just above
the insertion of the deltoid muscle.

THANK YOU