PULMONARY TUBERCULOSIS

Fb/Nurse Info

INTRODUCTION

- Tuberculosis (TB) is one of the most prevalent infections of human beings and contributes considerably to illness and death around the world. It is spread by inhaling tiny droplets of saliva from the coughs or sneezes of an infected person.it is a slowly spreading, chronic, granulomatous bacterial infection, characterized by gradual weight loss

DEFINITION

- Tuberculosis is the infectious disease primarily affecting lung parenchyma is most often caused by mycobacterium tuberculosis.it may spread to any part of the body including meninges,kidney,bones and lymphnodes.

MYCOBACTERIUM TUBERCULI

TYPES

- PULMONARY TUBERCULOSIS
- AVIAN TUBERCULOSIS(MICROBACTERIUM AVIUM ;OF BIRDS)
- BOVINE TUBERCULOSIS(MYCOBACTERIUM BOVIS ;OF CATTLE)
- MILIARY TUBERCULOSIS / DISSEMINATED TUBERCULOSIS

INCIDENCE

- With the increased incidence of AIDS, TB has become more a problem in the U.S., and the world.
- It is currently estimated that 1/2 of the world's population (3.1 billion) is infected with Mycobacterium tuberculosis
- Global Emergency Tuberculosis kills 5,000 people a day
- 2.3 million die each year

ETIOLOGY

- Mycobacterium tuberculosis
- Droplet nuclei(coughing,sneezing,laughing)
- Exposure to TB

RISK FACTORS

- CLOSE CONTACT WITH SOME ONE WHO HAVE ACTIVE TB.
- IMMUNO COMPROMISED STATUS (ELDERLY,CANCER)
- DRUG ABUSE AND ALCOHOLISM
- PEOPLE LACKING ADEQUATE HEALTH CARE
- PRE EXISTING MEDICAL CONDITIONS (DIABETES MELLITUS,CHRONIC RENAL FAILURE)
- IMMIGRANTS FROM COUNTRIES WITH HIGHER INCIDENCE OF TB.
- INSTITUTIONALISATION(LONG TERM CARE FACILITIES)

- LIVING IN SUBSTANDARD CONDITIONS
- OCCUPATION(HEALTH CARE WORKERS)

PATHOPHYSIOLOGY

- (INITIAL INFECTION OR PRIMARY INFECTION)
- ENTRY OF MICRO ORGANISM THROUGH DROPLET NUCLEI
- BACTERIA IS TRANSMITTED TO ALVEOLI THROUGH AIRWAYS
- DEPOSITION AND MULTIPLICATION OF BACTERIA
- BACILLI ARE ALSO TRANSPORTED TO OTHER PARTS OF THE BODY THROUGH BLOOD STREAM AND LYMPHNODE

INFLAMMATION

- PHAGOCYTOSIS BY NEUTROPHILS AND MACROPHAGES
- ACCUMULATION OF EXUDATE IN ALVEOLI
- BRONCHO PNEMONIA
- NEW TISSUE MASSES OF LIVE AND DEAD BACILLI ARE SURROUNDED BY MACROPHAGES WHICH FORM A PROTECTIVE MASS AROUND GRANULOMAS
- GRANULOMAS THEN TRANSFORMS TO FIBROUS TISSUE MASS AND CENTRAL PORTION OF WHICH IS CALLED GHON TUBERCLE

- THE MATERIAL (BACTERIA AND MACROPHAGES BECOMES

NECROTIC FORMING CHEESY MASS

- MASS BECOMES CALCIFIED AND BECOMES COLAGENOUS SCAR
- BACTERIA BECOME DORMANT AND NO FURTHER PROGRESSION

OF ACTIVE DISEASE

- (ACTIVE DISEASE : RE INFECTION)
- INADEQUATE IMMUNE RESPONSE
- ACTIVATION OF DORMANT BACTERIA

- GHON TUBERCLE ULCERATES AND RELEASING CHEESY MATERIAL INTO BRONCHI
- BACTERIA THEN BECOME AIRBORNE RESULTING IN FURTHER SPREAD OF INFECTION
- ULCERATED TUBERCLE HEALS AND BECOMES SCAR TISSUE
- INFECTED LUNG BECOME INFLAMMED
- FURTHER DEVOLOPMENT OF PNEUMONIA AND TUBERCLE FORMATION
- UNLESS THE PROCESS IS ARRESTED IT SPREADS DOWNWARDS TO THE HILUM OF LUNGS

AND LATER EXTENDS TO ADJASCENT LOBES

CLINICAL MANIFESTATIONS

- CONSTITUTIONAL SYMPTOMS

- Anorexia
- Low grade fever
- Night sweats
- Fatique
- Weight loss

- PULMONARY SYMPTOMS

- Dyspnea
- Non resolving bronchopneumonia
- Chest tightness
- Non productive cough
- Mucopurulent sputum with hemoptpysis
- Chest pain

- EXTRA PULMONARY SYMPTOMS

- Pain
- Inflammation

ASSESSMENT AND DIAGNOSTIC FINDINGS

- HISTORY COLLECTION
- PHYSICAL EXAMINATION

- Clubbing of the fingers or toes (in people with advanced disease)
- Swollen or tender lymph nodes in the neck or other areas
- Fluid around a lung (pleural effusion)
- Unusual breath sounds (crackles)

- IF MILIARY TB;
- A physical exam may show:
- Swollen liver
- Swollen lymph nodes
- Swollen spleen

Tests may include:

- Biopsy of the affected tissue (rare)
- Bronchoscopy
- Chest CT scan
- Chest x-ray
- Interferon-gamma release blood test such as the QFT-Gold test to test for TB infection
- Sputum examination and cultures
- Thoracentesis
- Tuberculin skin test (also called a PPD test)

QUANTIFERON GOLD TEST

- QFT-Gold test measures interferon-gamma in the testee's blood after incubating the blood with specific antigens from M. Tuberculosis proteins

TUBERCULIN SKIN TEST

- 0.1 ML OF PPD IS INJECTED FOREARM(SC)
- AFTER 48-72 HRS CHECK FOR INDURATION AT THE SITE
- IF INDURATION IS EQUAL TO AND MORE THAN 10MM
- POSITIVE

COMPLICATIONS

- Bones. Spinal pain and joint destruction may result from TB that infects your bones(TB spine or potss spine)
- Brain(meningitis)
- Liver or kidneys
- Heart(cardiac tamponade)
- Pleural effusion
- Tb pneumonia
- Serious reactions to drug therapy(hepato toxicity;hypersentivity)

MEDICAL MANAGEMENT

- PULMONARY TB is treated primarily with antituberculosis agents for 6 to 12 months.

- *Pharmacological management*

- First line antitubercular medications

- Streptomycin 15mg/kg
- Isoniazid or INH(Nydrazid) 5 mg/kg(300 mg max perday)
- Rifampin 10 mg/kg
- Pyrazinamide 15 – 30 mg/kg
- Ethambutol(Myambutol) 15 -25 mg/kg daily for 8 weeks and continuing for up to 4 to 7 months

- Second line medications
- Capreomycin 12 -15 mg/kg
- Ethionamide 15mg/kg
- Paraaminosalycilate sodium 200 – 300 mg/kg
- Cycloserine 15 mg/kg
- Vitamin b(pyridoxine) usually adminstered with INH
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Third line DRUGS

- Other drugs that may be useful, but are not on the WHO list of SLDs:
- Rifabutin
- Macrolides:e.g.,clarithromycin (CLR)
- Linezolid(LZD)
- Thioacetazone(T)
- Thioridazine
- Arginine

DOTS

- DOTS (directly observed treatment, short-course), is the name given to the World Health Organization–recommended tuberculosis control strategy that combines five components:

1. Government commitment (including both political will at all levels, and establishing a centralized and prioritized system of TB monitoring, recording and training)
2. Case detection by sputum smear microscopy
3. Standardized treatment regimen directly observed by a healthcare worker or community health worker for at least the first two months
4. A regular drug supply
5. A standardized recording and reporting system that allows assessment of treatment results

- DOT is especially critical for patients with drug-resistant TB, HIV-infected patients, and those on intermittent treatment regimens (i.e., 2 or 3 times weekly).

MULTIDRUG THERAPY

- Multiple-drug therapy to treat TB means taking several different antitubercular drugs at the same time.
- The standard treatment is to take isoniazid, rifampin, ethambutol, and pyrazinamide for 2 months. Treatment is then continued for at least 4months with fewer medicines

NURSING MANAGEMENT

- Assessment
- Obtain history of exposure to TB
- Assess for symptoms of active disease
- Auscultate lungs for crackles
- During drug therapy assess for liver function

Nursing diagnosis

- Ineffective breathing pattern related to pulmonary infection and potential for long term scarring with decreased lung capacity
- *Interventions*
- Administer and teach self administration of medications ordered
- Encourage rest and avoidance of exertion
- Moniter breath sounds respiratory rates ,sputum production and dyspnoea
- Provide supplymental oxygen as ordered
- Encourage increased fluid intake
- Instruct about best position to facilitate drainage

- Risk for spreading infection related to nature of disease and patients symptoms
- Be aware that TB is transmitted by respiratory droplets
- Use high efficiency particulate masks for high risk procedures including endoscopy
- Educate patient to control the spread of infection by covering mouth and nose while coughing and sneezing
- Isolation of patient
- Instruct about risk of drug resistance if drug regimen is not strictly and continuosly followed
- Carefully moniter vital signs and observe for temperature changes

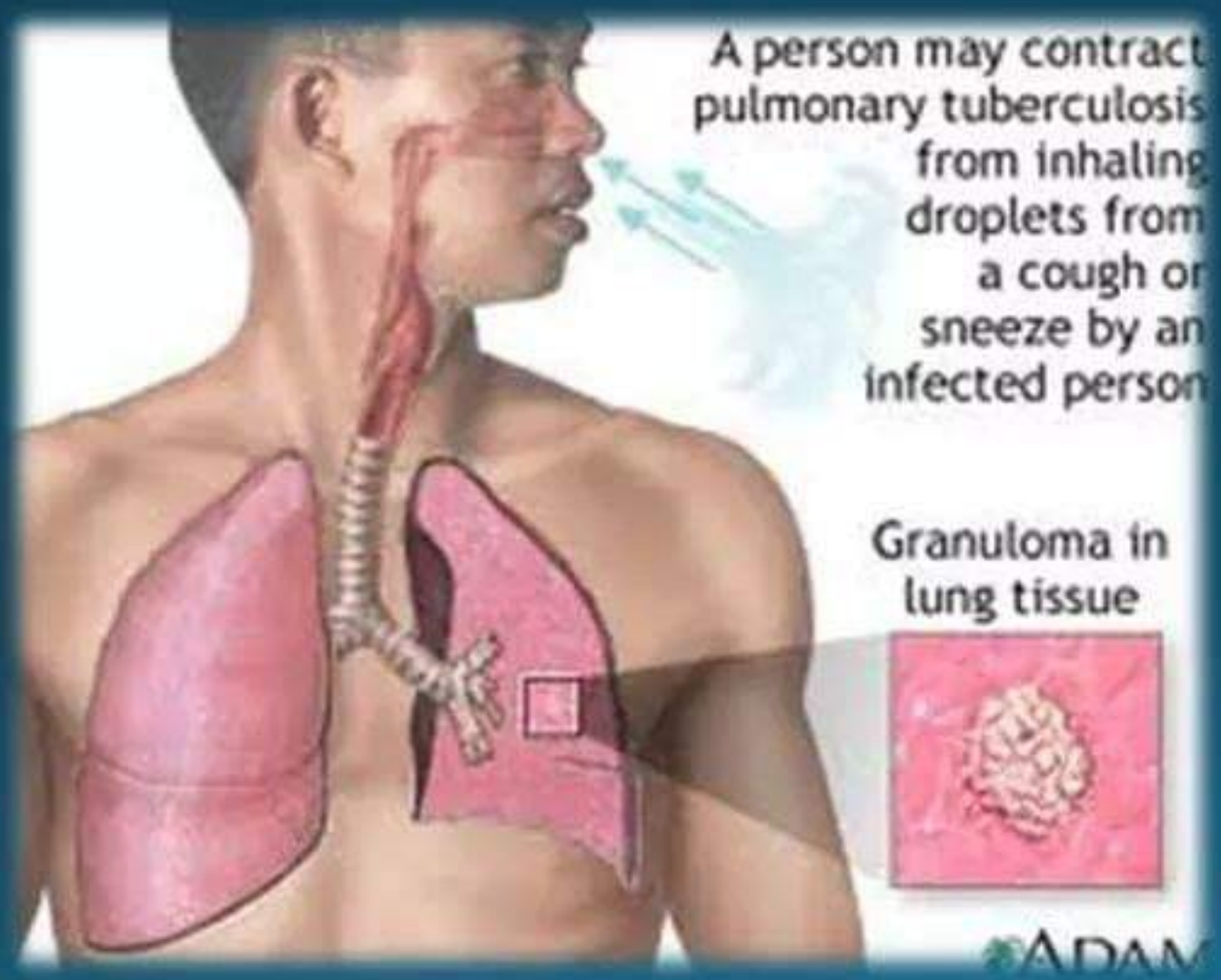
- Imbalanced nutrition less than body requirement related to poor appetite ,fatique and productive cough
- Explain the importance of eating nutritious diet to promote healing and defense against infection
- Provide small frequent meals
- Moniter weight of the patient
- Administer vitamin supplyments as ordered

- Non compliance related to lack of motivation and lack of treatment
- Educate patient about etiology transmission and effects of TB
- Review adverse effects of drug therapy
- Participate in observation of medicine taking,weekly pill counts or programmes designed to increase compliance with the treatment for TB
- Explain that TB is a communicable disease and that taking medications is most effective way of preventing transmission
- Instruct about medications schecule and side effects

Prevention

- ISOLATION
- Ventilate the room
- Cover the mouth
- Wear mask
- Finish entire course of medication
- vaccinations

CONCLUSION


A person may contract
pulmonary tuberculosis
from inhaling
droplets from
a cough or
sneeze by an
infected person
Granuloma in
lung tissue