**TRIBHUWAN UNIVERSITY**

**INSTITUTE OF MEDICINE**

**POKHARA NURSING CAMPUS**

**RAMGHAT-12, POKHARA**

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**Lesson Plan on: Tuberculosis**

**Submitted to: Submitted by:**

Respected madam, Himali Thapa

Bishnu Gurung Roll no: 08

Lecturer BNS 2nd year

Lesson plan on Tuberculosis

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| --- |
| Name of student teacher: Himali Thapa |
| Subject: Adult Health Nursing I |
| Unit: Common health problem of young Adult |
| Topic: Physical problem (Tuberculosis) |
| Date: 2080 – 11 - 3 |
| Venue: BNS 1st year |
| Time:1-2 pm |
| Duration: 60 mins |
| Number of participants: 36 |
| Level of participants: BNS 2nd year |
| Language: English + Nepali |
| Teaching/ Learning method: Brainstorming, interactive lecture, Discussion |
| Teaching, Learning media: PowerPoint, Whiteboard, poster ,metacard |
| Name of supervisor: Respected madam,  Bishnu Gurung |

**General Objective:**

At the end of session, BNS 1st year students will be able to explain about tuberculosis.

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| --- | --- | --- | --- | --- | --- | --- |
| SN | Specific objectives | Content | Time | Teaching/  Learning  Method | Teaching/ Learning  media | Evaluation |
|  | At the end of the teaching session, participants will be able to: | * Greetings * Review of previous class * Introduction   . self  . topic  . objectives  . pretest | 2  min | Brainstorming | Case scenario |  |
| 1. 1 | introduce tuberculosis (TB) | Introduction of tuberculosis | 2 min | Interactive lecture | powerpoint | What is tuberculosis? |
|  | state the type of TB | type of TB | 2  Min | Interactive lecture | powerpoint | What are the type of TB? |
| 1. 2. | explain epidemiology  Of tuberculosis | epidemiology of tuberculosis | 2min | Interactive lecture | powerpoint | What is the epidemiology of tuberculosis ? |
|  | state the causative agent and risk factor of tuberculosis | causative agent and risk factor of TB | 4min | Interactive lecture+ | metacard | What are the causativeagent and risk factor of tuberculosis? |
| 1. 4. | explain mode of trasmission of tuberculosis | mode of transmission of tuberculosis | 5 min | Interactive lecture | powerpoint | What are the mode of transmission of TB? |
| 1. 7. | explain pathophysiology of TB | pathophysiology of TB | 5min | Interactive lecture | powerpoint+white board and marker | What is  pathophysiology of TB ? |
| 1. 8. | state the clinical features of TB | clinical features of TB | 2 min | Interactive lecture | powerpoint | What are the clinical features of TB ? |
| 1. 9. | explain about diagnostic measure of TB | diagnostic measure of TB | 5 min | Interactive Lecture | powerpoint | what are diagnostic measure of TB? |
| 1. 10 | explain management of TB | management of TB | 10min | Interactive lecture | powerpoint | What are the management of TB? |
| 1. 10 | Discuss nursing management about TB | nursing management of TB | 8  min | Interactive lecture | powerpoint | what are the nursing management of TB? |
|  | explain the preventive measure of TB. | preventive measure of TB | 5min | discussion | powerpoint | What are the preventive measure of TB? |
| 1. 11 |  | Summarization  References  Question  Home assignment  Plan for next class | 3 min  1 min  1 min |  |  |  |

**Introduction:**

Tuberculosis (TB) is an **infectious disease** that primarily affects the **lung parenchyma**. It also may be transmitted to other parts of the body, including the meninges, kidneys, bones, and lymph nodes. The primary infectious **agent**, **M.** **tuberculosis**, is an acid-fast aerobic rod that grows slowly and is sensitive to heat and ultraviolet light. **Mycobacterium *bovis*** and **Mycobacterium *avium*** have rarely been associated with the development.

**Types:**

Mainly two types:

1. **Pulmonary tuberculosis**
   * + - Primary
       - Secondary
2. **Extrapulmonary tuberculosis**

**Pulmonary tuberculosis:**

It is a contagious infection that involves the lungs. Infection is caused by mycobacterium tuberculosis bacteria.

**Extrapulmonary tuberculosis(EPTB)**

EPTB refers to **TB involving organs other than the lungs** (e.g., pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, or meninges).

**Epidemiology**World Health Organization report of 202210.6 million people become ill with tuberculosis in 2021, compared with 10.1 million in 2020.1.6 million people died from tuberculosis in 2021 compared with 1.5 million in 2020.6 million men, 3.4 million women and 1.2 million children.

**Nepal**

**-** 117000 people are living in Nepal with Tuberculosis. -69000 people developed Tuberculosis in 2018.-The Tuberculosis incidence (new cases) was found to be higher (1.6 times) than previously thought. The National Tuberculosis Prevalence Survey (TBPS) 2018-19

**Causative agent:**

1. Mycobacterium tuberculosis (Human type)
2. Mycobacterium Bovis (Bovine type)

**Risk factor**

* **Close contact** with someone who has active TB. Inhalation of airborne nuclei from an infected person is proportional to the amount of time spent in the same air space the proximity of the person, and the degree of ventilation.
* **Immunocompromised status** (e.g., those with HIV infection cancer, transplanted organs, and prolonged high-dose corticosteroid therapy).
* **Substance abuse** (IV/injection drug users and alcoholics). Any person without adequate health care (the homelest Ampoverished; minorities, particularly children <15 years and young adults between ages 15 and 44 years).
* **Preexisting medical conditions or special treatment** (eg. diabetes, chronic kidney injury, malnourishment, selected malignancies, hemodialysis, transplanted organ, ). Institutionalization (e.g., long-term care facilities, psychiatric institutions, prisons).
* Living in **overcrowded**, substandard housing. Being a health care worker **performing high-risk activities.**
* **Immigrants from other countries with high incidence of TB (Southeast Asia)**
* administration of aerosolized pentamidine and other medications, sputum induction procedures, bronchoscopy, suctioning, coughing procedures, caring for the immunosuppressed patient. home care with the high-risk population, and administering

**MODE OF TRANSMISSION:**

Human beings acquire infection with tubercle bacilli by one of the following routes:

1. **Inhalation**of organisms present in fresh cough droplets or in dried sputum from an open case of pulmonary tuberculosis.
2. **Ingestion**of the organisms leads to development of tonsillar or intestinal tuberculosis. This mode of infection of human tubercle bacilli is from self-swallowing of infected sputum of an open case of pulmonary tuberculosis, or ingestion of bovine tubercle bacilli from milk of diseased cows.
3. **Inoculation**of the organisms into the skin may rarely occur from infected postmortem tissue.
4. **Transplacental route**results in development of congenital tuberculosis in foetus from infected mother and is a rare mode of transmission.

* The act of coughing, sneezing and speaking release a large number of droplets containing as many as 3000 infectious airborne droplets nuclei per cough.
* The droplet nucleus is small, measures 5 µm or less, and may contain approximately 1-10 tubercle bacilli.
* Theoretically, although a single tubercle bacillus may cause disease, in practice 5-200 inhaled bacilli are essential for infection.
* These droplets by virtue of their small size remain suspended in the air for a very long period of time.

**Incubation period**

2-12 weeks, may remain latent for life.

**Pathophysiology:**

Inhalation of mycobacterium tuberculosis

Body immune system responds by initiating an inflammatory process

Inhaled bacteria is phagocytosed by alveolar macrophages

Tissue reaction results in accumulation of exudated in alveoli causing bronchopneumonia

Inflammatory process and cellular reaction produces a small white nodules called primary tubercles

New tissue masses of live and dead bacilli are surrounded by macrophages

Transformed to fibrous centre of which is called Ghon’s tubercle

Materials becomes necrotic, forming a cheesy mass, may become calcified to collagenous scar.

Ghon’s tubercle ulcerate releasing cheesy materials.

Become airborne and spread slowly downwards to other parts of the lungs.

Signs and symptoms of active TB include:

1. Productive Cough lasts 2 or more weeks

2. Unintentional weight loss

3. Fatigue

4. Fever

5. Night sweats

6. Chills

7. Loss of appetite

8. Coughing up blood or sputum

1. Chest pain, or pain with breathing or coughing

**Extra pulmonary tuberculosis symptoms**

Persistently swollen glands

Abdominal pain

Pain and loss of movement in an affected bone or joint

Confusion

A persistent headache

Fits (seizures)

Tuberculosis can also affect other parts of the body including kidneys, spine, or brain. When TB occurs outside lungs, signs and symptoms vary according to the organs involved. For example, TB of the spine may cause back pain, and TB in the kidneys might cause blood in urine (hematuria).

**Diagnostic test:**

1. History Taking: age, sex, occupation, diet pattern, living condition, family history, personal habits, disease condition, medication, migrations etc.
2. Physical examination: body weight, BMI, vital signs, breath sounds,
3. Microscopy examination

-AFB staining

1. Tuberculin skin test

-Mantoux test:Purified protein derivative (PPD) tuberculin, it is a precipitate of species-nonspecific molecules obtained from filtrates of sterilized, concentrated cultures. 0.1 ml is injected intradermally (between the layers of dermis) and read 48 to 72 hours later. 5 mm, 10 mm, or 15 mm of induration is if observed, he/she has been exposed to TB.

1. Chest X-ray

The following abnormalities on CXR are suggestive of TB:

* Opacification in the lung tissue .
* Miliary mottling in lung tissue .

1. The GeneXpert MTB/RIF:

-detects DNA sequences specific for Mycobacterium tuberculosis and rifampicin

resistance by polymerase chain reaction

1. Culture:Colony characteristics;Dry, rough, raised 3-4 mm in diameter, irregular, first creamy white latter it becomes yellowish.
2. CT scan or MRI
3. Blood test: ESR, VDRL, TC, DC, HIV

**New guideline is therefore, an update from the 2012 General Manual (Third Edition) and the following are the major changes to TB management for Nepal:**

1. Only 2 sputum samples required for initial diagnosis of TB.
2. Same-day diagnosis of TB by Microscopy (2 samples same day-1 hour apart) Only 1 sputum sample required for follow up examination.
3. Treatment is not extended at the end of the intensive phase, even though the sputum follow up examination result remains positive at the end of two months, continuation phase is commenced regardless of whether the sputum is positive or not.
4. Streptomycin containing Category II regimen for retreatment cases will No Longer be used in Nepal
5. New definitions TB suspect is changed to Presumptive TB

**Medical management:**

* Treatment of tuberculosis should be started immediately after confirmation of TB diagnosis.
* For TB patients to be effectively treated,

-TB patients must be given the right drugs in the right combinations,

-appropriate dosage,

-administered correctly and regularly for the appropriate duration of time

under observation.

* The best way to ensure effective treatment for TB patients is to support medicine intake through Directly Observed Treatment, Short course (DOTS) using fixed-dose combination (FDC) tablets.
* All TB treatment must be given under DOT.

**TABLE 7.7: TB Treatment Duration**

|  |  |  |
| --- | --- | --- |
| **Type of Tuberculosis** | **Intensive phase** | **Continuation phase** |
| **New TB cases**:  Adult and  childhood  Bacteriological: or  clinically diagnosed  Pulmonary or  extra-pulmonary | 2HRZE | 4HR |
| **Complicated/severe**  EP cases (CNS TB,  TB pericarditis,  Miliary TB) | 2HRZE | 7-10 HRE |

**DR TB**

Refer to National Guidelines on DR-TB management guidelines (2019)

\* For complicated EP cases, if treatment is required beyond **12 months**, then refer to a higher level centre for treatment decision

**Side effect of TB Drugs**

|  |  |
| --- | --- |
| **DRUG** | **SIDE EFFECTS** |
| isoniazid (INH) | Hepatitis, asymptomatic elevation of aminotrans- ferases (ALT, AST) |
| rifampicin | Hepatitis, orange discoloration of bodily fluids (sputum, urine, sweat, tears) |
| pyrazinamide (PZA) | Hepatitis, arthralgias, hyperuricemia |
| ethambutol | Ocular toxicity (decreased red-green color discrimination) |
| levofloxacin | Gl disturbance, neurologic effects (dizziness, headache), |

**Nursing management**

**Assessment**

* Complete history taking and physical examination
* Clinical manifestation of fever, weight loss, anorexia, night sweats, fatigue, cough and sputum production prompt and more through assessment of respiratory function
* Assessing lungs for consolidation by evaluating breathe sounds (diminished bronchial sounds, crackles)
* Observe dietary pattern
* Reconsider special recommendation and activity level

**Nursing Diagnosis**

1. Ineffective airway clearance related to copious trachea- bronchial secretions.
2. Alter body temperature related to infectious process.
3. Activity in tolerance related to fatigue, altered nutritional status and fever.
4. Altered nutrition less than body requirements related to anorexia, fever, severity of illness , mental confusion.
5. Anxiety related to deficient knowledge about treatment regimen and preventive health measures.
6. Non-compliance to therapeutic regimen related to long-term treatment .

**Nursing Intervention**

**Ineffective airway clearance:**

* Monitor the breathing sound for the presence of crackles or wheeze and amount, colour and consistency of the sputum.
* Turn patient 2 hourly if bed ridden or encourage to ambulate if able.
* Provide nebulization as needed.
* Obtain order for chest physiotherapy.
* Increase fluid intake promotes systemic hydration and serves as an
* effective expectorant.

**Alter body temperature**

* Assess and monitor the patient’s condition, vital signs including temperature, pulse, respiration the condition of mucus membrane.
* Adjust environmental factor and remove heavy blankets and clothes and maintain ventilation in room
* Apply tepid water sponging for about 20-30 minutes
* Encourage patient to increase fluid intake equal to his /her urine
* output
* Provide adequate diet to anticipate the increase need during disease.

**Imbalanced nutrition**

* Document patient’s nutritional status on admission, noting the skin turgor, current weight and degree of weight loss,
* Monitor and manage patient’s usual dietary pattern including selection of diet.
* Provide oral care before and after respiratory treatments.
* Encourage small, frequent meals with foods high in protein and carbohydrates.

**Deficient knowledge about preventive measures**

* Milk parturition and milk boiling, do not take raw milk.
* Well ventilated room
* Protection against exposure to TB
* Use mask for preventing droplet enter into the lungs
* Give BCG vaccine to all children to prevent tuberculosis.
* Prevention of malnutrition.
* Promote environmental sanitation, reduce overcrowded.
* Sputum disposes properly, use sputum pots with lids, covering the mouth with hands when coughing and sneezing.

**Improving compliance with treatment regimen**

* Explain the importance of treatment regimen.
* Provide information about expected side effects of TB drugs.
* Refer the patients to direct observation therapy.

**Prevention**

* BCG vaccination
* Build well ventilated house
* Have nutritious diet to improve immunity
* Cover mouth with mask
* Isolation of infected person
* Finish entire course of medication
* Mass awareness programme should be implemented.
* Avoid over crowded areas
* Immunization for adult while travelling to endemic area

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**Summary**

Tuberculosis (TB) is an **infectious disease** that primarily affects the **lung parenchyma**. It also may be transmitted to other parts of the body, including the meninges, kidneys, bones, and lymph nodes. The primary infectious **agent**, **M.** **tuberculosis**, is an acid-fast aerobic rod that grows slowly and is sensitive to heat and ultraviolet light.World Health Organization report of 202210.6 million people become ill with tuberculosis in 2021, compared with 10.1 million in 2020.

**Question:**

**Choose the correct one:**

The full form of DOTS is :

Directly Observed Transient Short course

Directly Observed Treatment Short course

Directly Observed The Short course

**Home assignment**

1. Define Tuberculosis. List out risk factors and mode of transmission of tuberculosis.
2. Explain the medical and nursing management of tuberculosis.

**Plan for next class**

We will discuss about sub-fertility in our next class

**References**

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THANK YOU