



Antituberculous Drugs



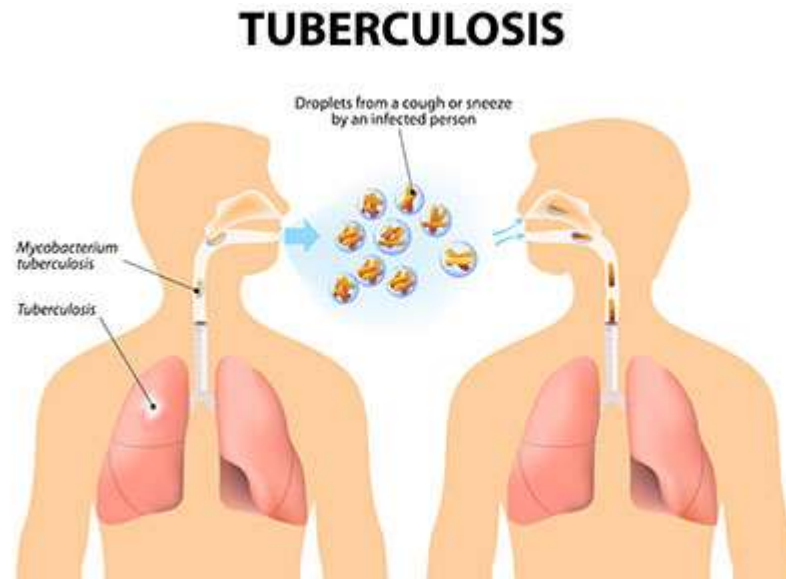
Drug Journey

- Introduction
- Classifications
- MOA (Pharmaodynamic)
- Indications/Uses
- Contraindications
- Side effects
- Nurse 's Responsibility

- **Pharmacodynamic**----What the drug does to body.
- **Pharmacokinetic**---What the body does to drug. (absorption, metabolism, excretion)

Antituberculotic Drugs

Treat the TB, which is caused by
Mycobacterium tuberculosis



Classifications

- 1. First Line Antituberculous Drugs**
- 2. Second Line Antituberculous Drugs**
- 3. Newer Antituberculous Drugs**

First-line drugs are first administered for diseases, and are usually chosen due to less side effects and high clinical effectiveness.

- Second Line----

They are used when first-line drugs show no effect for the disease

Classifications

- **First Line Antituberculous Drugs**
(RIPES)

- Isoniazid (H)
- Rifampicin (R)
- Ethambutol (E)
- Pyrazinamide (Z)
- Streptomycin (S)





Second Line Antituberculous Drugs

- Aminoglycosides----Amikacin, Gentamycin, Kanamycin
- Ethionamide
- Paraamino Salicylic Acid
- Thiacetazone



KEPT

(Please TAKE Carbon Copy)

Paraamino salicylic acid

Thiacetazone

Amikacin

Kanamycin

Ethinamide

Capreomycine

Cycloserine


OCCRA.....OKRA

Newer Drugs

- Ofloxacin **Fluroquinolone antibiotics**
- Ciprofloxacin
- Clarithromycin
- Rifabutin
- Azithronycin

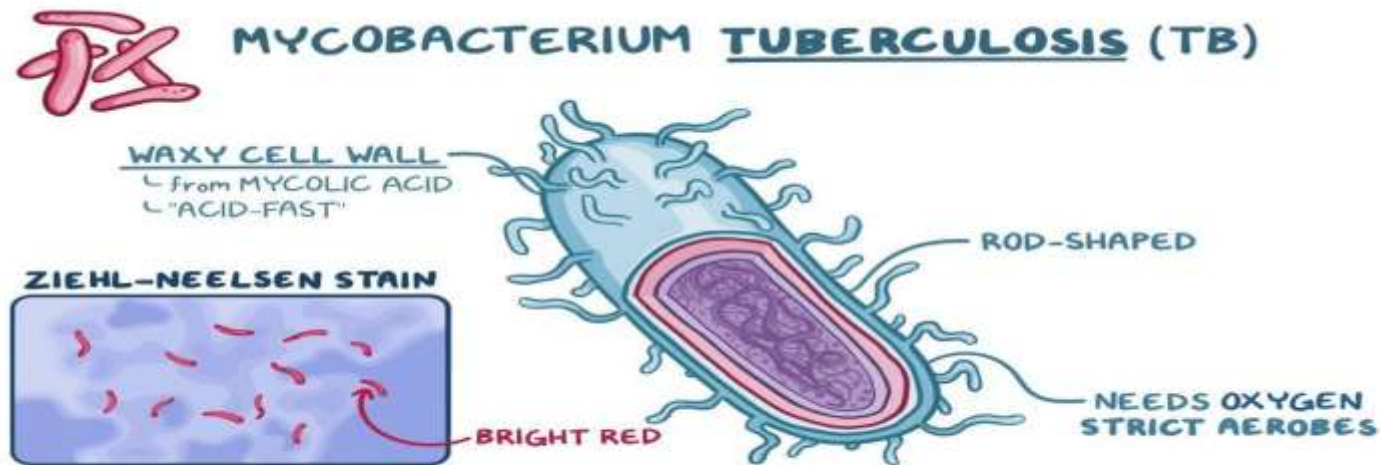


Mechanism of action

- Mycobacterium TB is a acid fast bacteria
- DNA RNA Polymerase mRNA

- Rifampicin ---Inhibit polymerization
- **Ethambutol** inhibits the growth of glucose molecules on the cell wall surface
- **Isoniazid & Pyrazinamide** disturb the mycolic acid on the wall of the bacteria.

Mechanism of action

Inhibit the cell wall synthesis, protein synthesis and nucleic acid synthesis.



Adverse effects of ATT drugs

Drug	Adverse effects
Isoniazid	Hepatotoxicity, peripheral neuritis, hypersensitive reactions may precipitate epilepsy, drug induced lupus, psychotic changes
Rifampicin	Hepatotoxicity, gastrointestinal, autoimmune reactions (more with intermittent administration), which include flu syndrome, thrombocytopenias, purpura, respiratory shock syndrome, acute hemolytic anemia, ARF)
Pyrazinamide	Hepatotoxicity, arthralgia, hyperuricemia, gastrointestinal, allergic reactions
Ethambutol	Optic neuritis, colour blindness, gastrointestinal, allergic reactions, hyperuricemia
Streptomycin	Vestibular dysfunction, deafness, nephrotoxicity, neuromuscular blockade, peripheral neuritis

TB Drugs Side Effects

I = **I**ron accumulates in mitochondria
(Sideroblastic anemia)

N = **N**euritis(peripheral)--->Give Vit B6

H=**H**epatitis

Also **INH** -3 letters like **SLE**

Ethambutol = **E**yes : viscu~~al~~ acuity 
Red Green
Discrimination
Optic neuritis

Pyrazinamide : **Hyperuricemia**
Uric acid
Puricindamide

Rifampin : **Red orange** metabolites
P450 induction

Note

- **Streptomycin**
- Damage to the 8th cranial nerve (Vestibularchochlear)
- Loss of hearing, balancing problem
- Ototoxicity
- Contraindicated in pregnant woman (Fetal Harm)

ATT

- **Isoniazid (H)**
- **Rifampin (R)**
- **Ethambutol (E)**
- **Pyrazinamide (Z)**
- **Streptomycin (S)**

2 MONTHS

2(HRZES)

3

3TIMES

Nurse's Responsibility

- Monitor the patient's for adverse effects.
- Assess for sensory impairment
- Hypersensitivity
- Monitor LFT results
- Monitor WBC Uric Acid level
- Maintain seizure precautions

ANTITUBERCULAR DRUGS

80. Which of the following is a common side effect of streptomycin

- a. Damage to facial nerve
- b. Damage to 8th cranial nerve
- c. Bone marrow depression
- d. Hypersensitivity

(ESI-2010)

81. Which of the following antitubercular drug causes red orange discoloration of urine?

[Bhopal Memorial Hospital Nursing Tutor, 2013]

- a. Isoniazid
- b. Ethambutol
- c. Streptomycin
- d. Rifampicin

Tinnutis

82. The anti-tuberculosis drug that has the potential for damage to the 8th cranial nerve is

a. Isoniazid (INH)

b. Ethambutol hydrochloride

c. Rifampicin

d. Streptomycin

83. Ototoxicity is a common side effect of the drug streptomycin.

This is due to the damage to

- a. 4th Cranial nerve
- b. 8th Cranial nerve
- c. 7th Cranial Nerve
- d. 10th Cranial Nerve

Streptomycin and

- Multiple choice
92. Which of the following antitubercular drug is an aminoglycoside
- a. Rifampicin
 - b. Isoniazid
 - c. Ethambutol
 - d. Streptomycin
93. Which of the following antitubercular drug causes damage to 8th cranial nerve?
- a. Rifampicin
 - b. Isoniazid
 - c. Pyrazinamide
 - d. Streptomycin
94. Streptomycin is not administered orally because
- a. It gets deactivated during first-pass metabolism
 - b. It can cause gastric ulcer
 - c. It can cause gastric bleeding
 - d. It is not absorbed orally

- 95. Which of the following antitubercular drugs is associated with red green colour blindness?**
- a. Cycloserine
 - b. Isoniazid
 - c. Pyrazinamide
 - d. Ethambutol
- 96. INH induced peripheral neuropathy results from deficiency of:**
- a. B1
 - b. B2
 - c. B6
 - d. B12
- 97. Peripheral neuritis is a side effect of which antitubercular drug**
- a. Rifampicin
 - b. Isoniazid
 - c. Streptomycin
 - d. Ethambutol
- 98. Peripheral neuritis caused by isoniazid can be prevented by providing**
- a. Niacin
 - b. Aspirin
 - c. Pyridoxine
 - d. Thiamine
- 99. Bacteriostatic antitubercular drug is:**
- a. Isoniazid
 - b. Rifampin
 - c. Streptomycin
 - d. Ethambutol

INH

- Isoniazid
- INH ---Isonicotinic Acid Hydrazide

100. Red orange discoloration of urine is caused by

- a. Rifampicin
- b. Isoniazid
- c. Ethambutol
- d. Pyrazinamide

101. All of the following are the side effects of Rifampicin EXCEPT

- a. Anorexia
- b. Dizziness
- c. Orange colored urine
- d. Hypertension

84. All of the following antitubercular drugs crosses blood-brain barrier EXCEPT
- a. Isoniazid
 - b. Rifampicin
 - c. Pyrazinamide
 - d. Streptomycin

85. Which of the following antitubercular drug causes peripheral neuropathy?

a. Isoniazid

c. Rifampicin

b. Pyrazinamide

d. Dapsone

86. Prolonged use of isoniazid (INH) leads to deficiency of
- a. Niacin
 - b. Cyanocobalamin
 - c. Folic acid
 - d. Pyridoxine

87. Which of the following anti tubercular drugs is contraindicated in a pregnant woman?

a. Pyrazinamide

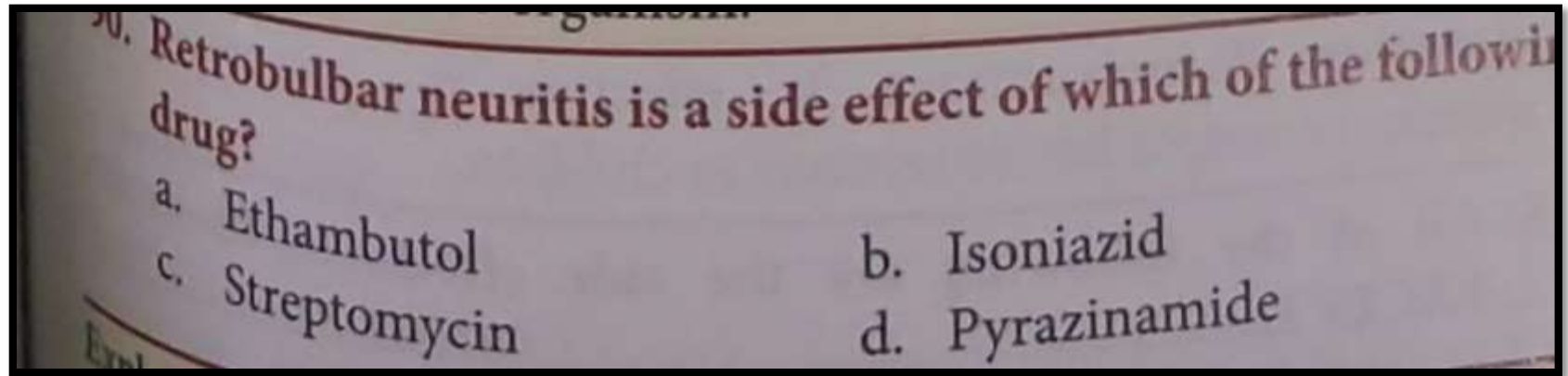
b. Isoniazid

c. Rifampicin

d. Streptomycin

88. The drug of choice for prophylaxis of tuberculosis is
- a. Streptomycin
 - b. Ethambutol
 - c. Isoniazid (INH)
 - d. Rifampicin

89. The purpose of combination drug therapy in the treatment of tuberculosis is to reduce
- a. The duration of treatment
 - b. Adverse effects of the drug
 - c. Dosage of drugs
 - d. Drug resistance



References

- Williams PH, Buhler FR, Fleckenstein A, et al. International Society and Federation of Cardiology: Working group on classification of Antituberculotics. *Am J Cardiol* 1987;60:630-632.
- Wilkins TY. is it time to split the lump? *Am J Hypertens* 1995;8:325-329.