PHA 306

SYSTEM PHARMACOLOGY

NAME: OYAKHILOME OMOTESE

DEPARTMENT: PHYSIOLOGY

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**ANSWER**

1. **NAME OF THE DRUG:**

Nitrofurantoin.

1. **ANTIBACTERIAL ACTIVITY:**

The drug ‘Nitrofurantoin’ is a drug that is commonly used for treating urinary tract infections (usually uncomplicated ones) because of its features including toxicity, its ability to inhibit or kill microorganisms (antimicrobial spectrum) and its bacterial resistance. I is resistant against bacteria such as E. Coli and Enterococci.

It is converted by bacterial nitroreductases to electrophilic intermediates which inhibits the citric acid cycle as well as the synthesis of DNA, RNA and Protein. Its antibacterial activity is higher in acidic urine as it is more bactericidal (kills bacteria) in higher urine acidity concentration (about 100ug/ml) while in lower acidity concentration, it is bacteriostatic (bacteria inhibiting).

1. **MECHANISM OF ACTION:**

When the Nitrofurantoin is converted to its intermediates it becomes highly reactive or hyper reactive which damages the DNA. It kills the bacteria by entering into their cell and damages the genetic material making it unable to repair or multiply hence stopping the infection.

1. **PHARMACOKINETICS:**

Nitrofurantoin is administered orally and is absorbed through the GIT in a rapid motion and is excreted predominantly through the urine with 25% of it unchanged after it has gone through GIT enzymes which causes the brown coloration of the urine.

The plasma concentration the drug is not increased to therapeutic level because the drug is rapidly absorbed and then eliminated.

1. **ADVERSE EFFECTS:**

They may include:

-Headache

-Dizziness

-Nausea

-Diarrhea/ Bloody Stool

- Vomiting

-Chest Pain

-Dry Cough

-Fever

-Demyelination

-Acute Pneumonitis

-Liver problems (Itching, Loss of appetite, Dark Urine)

-Hemolytic Anemia

-Numbness in hands and feet

-Tiredness

-Paleness