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**ANATOMY**

**QUESTION:**

1. A drug used in the treatment of urinary tract infection causes brown coloration of urine. Explain in full detail the pharmacology of the drug under the following headings:

a. Name of the drug

b. Antibacterial activity

c. Mechanism of action

d. Pharmacokinetics

e. Adverse effect

**Name of the drug:** Nitrofurantoin

Nitrofurantoin is an antibacterial agent specific for urinary tract infections. Nitrofurantoin is effective at treating uncomplicated urinary tract infections. There are two great advantages of nitrofurantoin in the treatment of urinary tract infection. First, that it reaches therapeutic concentration in urine after it has passed though renal excretion. Second, nitrofurantoin is most bactericidal in acdic environments; the urine being a prominent example of this.

**Antibacterial activity:** It is higher in acidic urine

Mechanism of action: Nitrofurantoin damages DNA since its reduced form is highly reactive. It is rapidly reduced in bacterial cells by flavoproteins (nitrofuran reductase) to multiple reactive intermediates that attack ribosomal protein, Dna, respiration, pyruvate metabolism and other macromolecules within the bacterial cell, thereby inhibiting protein synthesis.

**Pharmacokinetics:** Nitrofurantoin is absorbed rapidly and completely from the GIT tract.

Antibacterial concentrations are not achieved in plasma following ingestion of recommended doses because the drug is rapidly eliminated.

Nitrofuratoin colors the urine brown.

It is not used for pregnant women, individuals with impaired renal function, children younger than one month of age.

It is not recommended for the treatment of pyelonephritis or prostatis.

**Adverse effects:**

1. Gastrointestinal: Diarrhea, dyspepsia, abdominal pain,constipation,emesis

2. Neurologic: Dizziness, drowsiness, amblyopia

3. Respiratory: Acute pulmonary hypersensitivity