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17/MHS05/007

PHARMACOL0GY 306

Assignment

**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 effects

Solution

The drug to be used is classified under analgesics and antiseptic agents: Nitrofurantoin

Nitrofurantoin

It is less commonly employed for treating UTIs because of it’s narrow antimicrobial spectrum, frequent bacterial resistance and toxicity..

Nitrofurantoin is bacteriostatic for most susceptible micro-organisms at concentration of 32ug/ml or less and is bactericidal at concentrations of 100ug/ml and more. The antibacterial activity is higher in an acidic urine.

It is active against many strains of *E.Coli* and enterococci . However, most species of proteus and pseudomonas and many species of enterobacter and klebsiella are resistant.

MECHANISM OF ACTION

Nitrofurantion damages DNA since it’s reduced form is highly reactive.

It is rapidly reduced in bacterial cells by flavoproteins(nitofuran reductase) to multiple reactive intermediates that attack ribosomal proteins, DNA, respiration, pyruvate metabolism and other macromolecules within the bacterial cell, thereby inhibiting protein synthesis.

PHARMACOKINETICS

Nitrofurantion is absorbed rapidly and completely from the GIT .

Nitrofurantion colors 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

Acute pneumonitis

Haemolytic anemia

GI disturbances : these side effects include nausea, vomiting and diarrhea