ASSIGNMENT

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MATRIC NO: 17/MHS05/015

DEPARTMENT: PHYSIOLOGY

COURSE TITLE: SYSTEMIC PHARMACOLOGY

COURSE CODE: PHA 306

ASSIGNMENT TITLE: Drugs used in Urinary System Disorders.

Question:

1. A drug used in the treatment of urinary tract infection causes brown discoloration of urine. Explain in full detail the pharmacology of the drug under the following headings:\
2. Name of the drug.
3. Antibacterial activity.
4. Mechanism of action.
5. Pharmacokinetics.
6. Adverse effects.

Answers:

1. Nitrofurantoin.
2. The antibacterial activity of this drug is higher in an acidic urine. It is bacteriostatic (i.e. it stops the growth of bacteria without actually killing it) for most microorganisms at concentrations of 32ug/ml or less and is bactericidal (i.e. kills and destroys bacteria) at concentrations of 100ug/ml and more. Hence, it is not used commonly in treating urinary tract infections due to its narrow antimicrobial spectrum, frequent bacterial resistance and toxicity.
3. It inhibits the synthesis of protein by attacking macromolecules within the bacterial cells e.g. ribosomal proteins, DNA, pyruvate metabolism etc. after it is reduced in the cells by flavoproteins to multiple reactive intermediates. This reduction of the drug is rapid; and since its reduced form is highly reactive, it also damages DNA.
4. It is rapidly and completely absorbed from the gastrointestinal tract. It is not used for pregnant women, children younger than one month and people with impaired renal function. It is rapidly eliminated so, its concentration cannot be found in plasma after the recommended dose has been ingested. When it is excreted in the urine, it gives it a brown coloration.
5. Its adverse effects are:
* Acute pneumonitis.
* Hemolytic anemia.
* Gastrointestinal disturbances e.g. nausea, vomiting, and diarrhea.
* Neurological problems e.g. headache, nystagmus (rapid involuntary movement of the eye) etc.