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Pharmacology

300level

PHA306

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Assignment

A drug used in d treatment of urinary tract infection which causes brown coloration of urine. Explain in full details the pharmacology of the drug under the following headings.

...... Name of the drug,Antibacterial activity,Mechanism of action,Pharmacokinetics and Adverse effects.

(A) Name of drug:- Nitrofurantoin,.

**(B) Antibacterial activity:- Nitrofurantoin has broad antibacterial activity but its use in small animals is limited to treatment of lower urinary tract infections.*~~It is less commonly employed for treating urinary tract infection, because of its narrow antimicrobial spectrum, frequent bacterial resistance and toxicity. Sensitive bacteria reduce the drug to an active agent that inhibits various enzymes and damages DNA. Activity is greater in acidic urine.~~***

**Nitrofurantoin has activity against several Gram-negative and some Gram-positive aerobic bacteria including many isolates of Escherichia, Klebsiella, Enterobacter, Enterococcus, Staphylococcus and Salmonella.**

**It has little or no activity against most strains of Proteus and no activity against Pseuodmonas.**

**Nitrofurans have moderate activity against anaerobic bacteria and are most active in anaerobic conditions. Some aerobic bacteria that are resistant under aerobic conditions are susceptible when tested under anaerobic**

* **(C) Mechanism of action:- Nitrofurantoin is activated inside bacteria by reduction via the flavoprotein nitrofurantoin reductase to unstable metabolites, which disrupt ribosomal RNA, DNA and other intracellular components. It is bactericidal, especially to bacteria present in acid urine.**
* (D) 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.~~***
* ***~~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.~~***
* **(E) Adverse effects:-it includes, *~~nausea, vomiting, and diarrhea.~~***
* ***~~Acute pneumonitis~~***
* ***~~Neurological problems such as headache, nystagmus, and polyneuropathies with demyelination may occur.~~***

***~~.Hemolytic anemia~~* reported in small animals include gastrointestinal disturbances and hepatopathy.**