OMEJE PEACE OJOMA

17/MHS07/026

PHARMACOLOGY

300 LEVEL

PHA 306 – ORGAN SYSTEM PHARMACOLOGY

ASSIGNMENT

1. **NAME OF DRUG**

Nitrofurantoin

2. **ANTIBACTERIAL ACTIVITY**

Nitrofurantoin has narrow antimicrobial spectrum, frequent bacteria resistance and toxicity. It is bacteriostatic for most susceptible microorganisms at 32ug/ml or less and is bactericidal at concentrations of 100ug/ml and more. The antibacterial activity is higher in acidic urine. It has been show to have high activity against many strains of *E. coli, Bacillus subtillis sp., Citrobacter sp., Staphylococcus aureus, Streptococcus agalactiae, Staphylococcus saprophyticus* and *Enterococci.* However, most species of *Proteus and Pseudomonas* and many species of *Enterobacter and Klebsiella* are resistant.

3. **MECHANISM OF ACTION**

Nitrofurantoin acts by damaging the bacterial DNA since its reduced form is highly reactive. This is made possible by its rapid reduction inside the bacterial cell by flavoproteins (nitrofuran reductase) to multiple reactive intermediates that attack ribosomal proteins, DNA, respiration, pyruvate metabolism and other macromolecules within the cell thereby inhibiting protein synthesis and preventing various metabolic activities from taking place within the cell.

4. **PHARMACOKINETICS**

Nitrofurantoin ia absorbed rapidly and completely from the gastrointestinal tract. Antibacterial concentrations are not achieved in the plasma upon ingestion of recommended doses rather concentration is achieved in the urine because the drug is rapidly eliminated. The bioavailability is about 90%. Nitrofurantoin is metabolized by the liver and along with its metabolites, it is eliminated mainly by the kidney in the form of urine.

5. **ADVERSE EFFECTS**

a) Gastrointestinal disturbances which include: nausea, emesis, diarrhea, dyspepsia and abdominal pain.

b) Neurological problems such as; headache, nystagmus, drowsiness, amblyopia (lazy eye) and polyneuropathies with demyelination may occur.

c) Respiratory disorders: acute pulmonary hypersensitivity and acute pneumonitis.

d) Allergic reaction like urticaria and puritis may occur.

e) Other adverse effects are: hemolytic anemia, fever, chills and malaise.