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Due: September 6, 2023

Pharmacokinetics Class Preparation

Nursing 101

GI SYSTEM: The oral medication reaches the systemic circulation through the GI system. As a result, numerous factors can affect the absorption of the pill.

Questions:

1. A client is experiencing diarrhea. How could this affect absorption of an oral drug?

As oral medications are absorbed through the epithelial cells lining the GI tract, a client experiencing diarrhea would be less likely to absorb the full medicative dose. This is due to the affect diarrhea has to the epithelial cells lining the GI tract, greatly decreasing absorption rates.

2. How could the presence of food in the stomach affect the rate of absorption?

The presence of food in the stomach or intestines would cause a decreased absorption rate. This is due to food presence in the stomach decreasing gastric emptying.

CARDIOVASCULAR SYSTEM: Once the pill is absorbed into the bloodstream, it is carried or delivered to the sites of pharmacologic action where the drug produces its effects.

Question:

3. How do you think the distribution of the oral medication affected if a client has less than normal cardiac output?

As the distribution of medication is dependent on a person's circulation, permeability of cell membrane, and plasma protein binding, a patient with a decreased cardiac output would have a decreased distribution of medication. This occurs due to the inhibition or decreased blood flow or perfusion that is associated with a decreased cardiac output.

LIVER: Most biotransformation takes place in the liver. Any decrease in the ability of the liver to metabolize medication could lead to an accumulation of the active drug in the bloodstream. This could put the client at risk for toxic effects and adverse reactions.

Questions:

4. How might nutritional status affect metabolism?

A client's nutrition impacts their metabolic rate. Those who have poor nutrition or those who are malnourished have a decreased presence of enzymes that are necessary for the breakdown of certain compounds, including medication.

5. What factors influence the rate of medication metabolism?

The medication metabolic rate can be affected by an individual's age, nutritional status, other medication's metabolic pathways, the medication first pass through the liver, and the presence of increase of medication-metabolizing enzymes.

KIDNEYS: Drug excretion/elimination occurs mainly through the kidneys into the urine. If there is any impairment in kidney function, medications may not be excreted at the anticipated speed. Subsequent medication administration may lead to accumulation and potential toxicity.

Questions:

6. Why would very young and very old clients need to be closely monitored by nurse for signs and symptoms of drug toxicity?

Very old clients should be closely monitored by the nurse for signs and symptoms of drug toxicity as they are greater risk for kidney dysfunction, which would cause an increase in duration and intensity of the medication. Younger children should also be monitored as urinary excretion is more difficult to monitor and isn't as developed as older populations.

7. How can the nurse assess kidney function?

The nurse can assess kidney function by monitoring a patient's BUN and creatine levels.