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QUESTION NO: 1

Differenciate between general and local anesthesia, Explain stages of anesthesia in detail.

ANSWER:-

DIFFERENIATE BETWEEN GENERAL AND LOCAL ANESTHESIA:-

FEATURES	GENERAL ANESTHESIA	LOCAL ANESTHE-SIA.
• Site of action	Central Nervous System	Peripheral nerves
• Area of body involved	whole body	Restricated area
• Consciousness	Lost	Unaltered
• Care of vital functions	Essential	Usually not needed
• Poor heath Patients	Risky	Safer

• Use in noncooperative patients	Possible	Not possible
• Major Surgery	Prefferred	Cannot be Prefferred
• Minor surgery	Not preferred	preffered

Explain stages of anesthesia in detail.

ANSWER:-

STAGES OF ANESTHESIA:-

STAGE: 1 ANALGESIA:-
- Analgesia without ~~ame~~ amnesia

STAGE: 2 EXCITMENTS:-
- Nausea, vomiting, hyperreactivity, irregular respiration

STAGE: 3 SURGICAL ANESTHESIA:-
- Sleep, normal respiration and blood pressure.

STAGE: 4 MEDULLARY DEPRESSION.

- Depression of vasomotor and respiratory centers coma and death.

STAGE: 1 ANALGESIA.

- Starts from beginning of anesthesia thetic inhalation and Lasts upto loss of conciousness.
Pain is progressively abolished during this stage
- Patients remains conscious, can hear and see, and feels a dream like state.
- Reflexes and respiration remain normal
- It is difficult to maintain use is limited to short procedure only.

STAGE : 2 STAGE OF DELIRIUM AND EXCITEMENT:-

From loss of consiousness, to beginning of regular respiration

→ Excitement - Patient may shout, struggle and hold his breath.
→ Muscle tone increases, jaws are tightly closed
→ Breathing is jerky ; vomiting, involuntary micturition or defecation may occur.
→ Heart rate and BP may rise and Pupils dilate due to sympathetic stimulation.
→ No stimulus or operative procedure carried out during this stage
→ Breathing are commonly seen. Potentially dangerous responses can occur during this stage including vomiting, laryngospasm and uncontrolled movement.
→ This stage is not found with modern anesthesia paranesthetic mediation, rapid induction etc.

STAGE: 3 STAGE OF SURGICAL ANESTHESIA:-

→ Extends from onset of regular respiration to cessation of spontaneous breathing. This has been divided into 4 planes: Plane

→ 1 Roving eye balls. This plane ends when eyes become fixed.

→ Plane: 2; Loss of corneal and laryngeal reflexes.

→ Plane: 3 Pupil starts dilating and light reflex is lost

→ Plane: 4 Intercostal paralysis, shallow abdominal respiration, dilating pupil.

STAGE: 4 MEDULLARY / RESPIRATORY PARALYSIS:-

→ Cessation of breathing failure of circulation death

→ Pupils: widely dilated

→ Muscles are totally flabby

→ Pulse is imperceptible

→ BP is very low.

QNO:5

Part a:- Differentiate between broad and narrow spectrum antibiotics, classify antibiotic drugs?

ANSWER:

DIFFERENIATE BETWEEN BROAD AND NARROW SPECTRUM:-

- **Narrow** -spectrum antibiotics target a few types of bacteria.
- **Broad**. spectrum antibiotics target many types of bacteria.
- But using broad spectrum antibiotics when they are not needed can create antibiotic resistant bacteria that are hard to treat.

Broad spectrum antibiotics effective against both gram +ve and gram -ve bacteria e.g tetracycline.

Narrow spectrum antibiotics effective against only specific type of bacteria such as isoniazid → bacillus bacteria tuberculosis, macrolides and penicillins G".

CLASSIFICATION OF ANTIBIOTIC DRUGS:-

- Cell wall inhibitors
- Glycopeptides
- Protein synthesis inhibtors.
- Topoismare inhibitors
- Anti- metabolites
- Anti- mycobacterials.
- Sulfones.

CELL WALL INHIBITORS:-

Include
- Penicillins
- Cephalosporins
- Carbapenems
- glycopeptides.

GLYCOPEPTIDES:-

✓ (all GP and C. difficile - the oral form).

- Vancomycin

PROTEIN SYNTHESIS INHIBITORS:-

- 50S ribosome inhibitors.
  - Macrolides
  - Lincosamides

- 30S ribosomes inhibitors
  - Amino glycosides
  - Tetracyclines.

TOPOISOMARASE INHIBITORS.

- Flouroquinolones
- Rifampin
- Metronidazole

Anti Metabolites.

- Trimethoprim
- Sulfamethroxazole
- Nitrofurantoin

PLASMA MEMBRANE:-

- Polymyxins
- Polymyxin B
- Colistin
- Lipopeptide
- daptomycin

DNA SYNTHESIS:-

- Fluroquinolones
- Ciprofloxacin
- Levofloxacin
- moxifloxacin

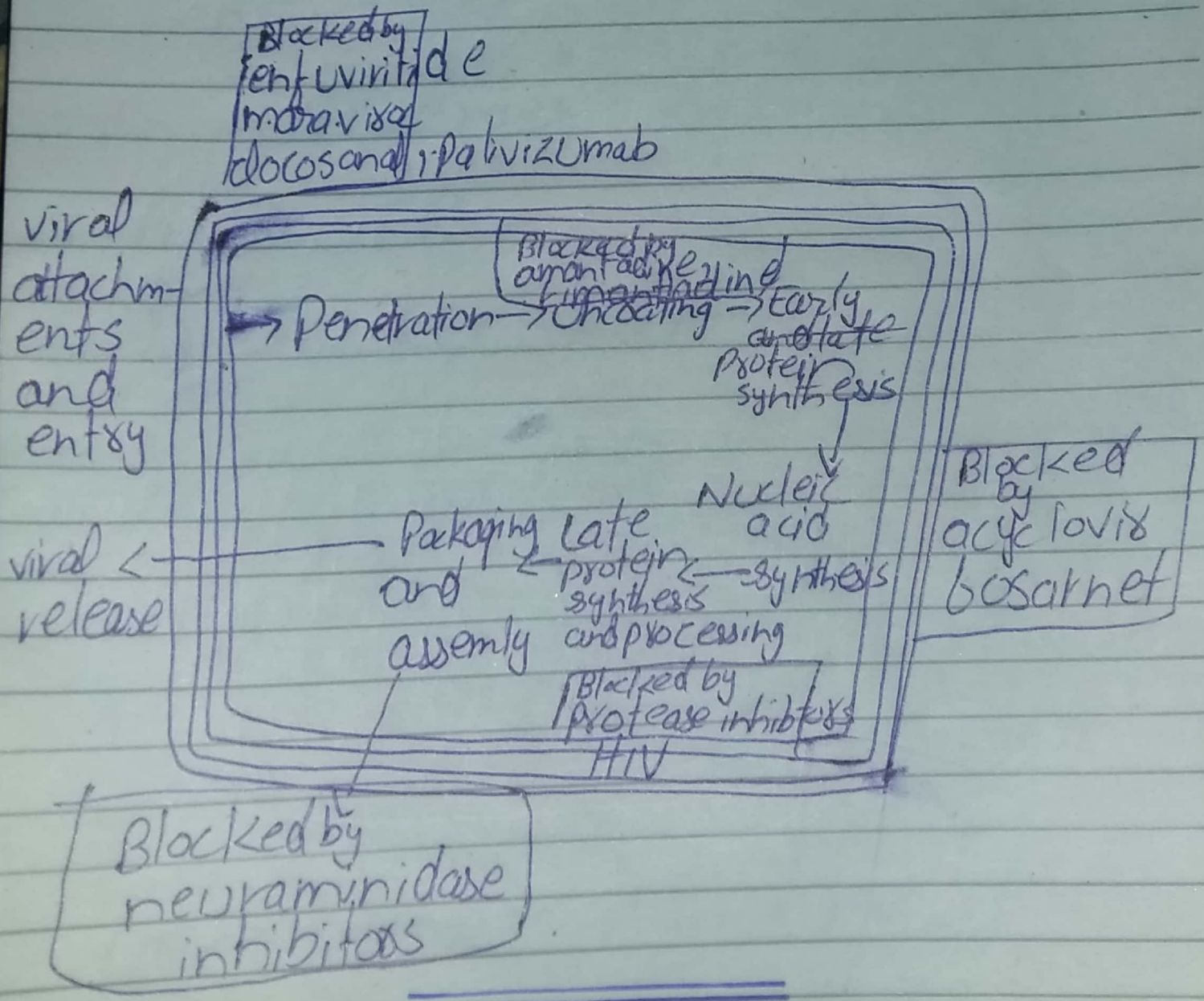
RNA SYNTHESIS:-

- Rifamycins
- rifampin.

METABOLIC PATHWAYS:-

- Folic acid Synthesis
- Sulfonamides
- Sulfones
- trimethoprim
- Mycolic acid synthesis
- Izoniazid.

MOA OF ANTIVIRAL AGENTS:-



QNO: 1

Define drug receptors, enumerate different receptor families and explain the receptors that shows its effect second messenger system.

ANSWER:-

DRUG RECEPTORS:-

Receptor is a macromolecule in the membrane or inside the cell, that specifically (chemically) bind a ligand (drug). The binding of a drug to receptors depends on types of chemical bounds that can be established b/w drug and receptor.

RECEPTORS FAMILY:-

1) Ligand - gated ion channels.
2) G protein coupled receptors
3) Enzyme linked receptor,
4) Intra cellular receptors.

Second messengers are small intracellular molecules that mediate the effects of first messengers, neurotransmitters and hormones. Some of the important second messengers in the nervous system are cAMP, cyclic guanosine monophosphate (cGMP), diacylglycerol (DAG), inositol trisphosphate (IP3), and Ca^{++} ions.

Second messengers

1- A common pathway turned on by Gs, and other types of G proteins, is the activation of adenylyl cyclase by αGTP subunits

2- G proteins also activate phospholipase C.

3- G proteins coupled receptors also activate guanylyl cyclase, which converts (GTP) to cyclic guanosin monophosphate (cGMP)

4- A fourth second messenger that stimulates cGMP-dependent protein kinase.

QNO: 2

Define drug interactions, enumerate its various types and explain pharmacokinetic drug interaction and its factors with examples.

ANSWER:-

DRUG INTERACTIONS:-

A drug interactions is a change in the action or side effects of a drug caused by concomitant administration with a food, beverage, supplement, or another drug. There are many cause of drug interactions.

An alternation in the duration or magnitude of pharmacological effects of one drug produced by another drug, food, blood, or any other substance.

TYPES:-

1) DRUG-DRUG Interactions) interaction between drugs come to mind.

2- DRUG-FOOD Interactions) Interactions may also exist between drugs and foods.

3- (Drug-plant Interactions) drugs and medicinal plants or herbs

4- DRUG-DISEASE Interactions

But there are essentially two types of drug interactions.

1- Pharmacokinetics DI
2- Pharmacodynamics DI.

PHARMACOKINETIC DRUG INTERACTION:-

These occurs when one drug alters the absorption, distribution, metabolism, or excretion of another, thus increasing or decreasing the amount of drug available to produce its pharmacological effects.

Hence sych interactions are also called as ADME interactions.

CLASSIFICATION:-

- Absorption interactions
- Distribution interactions
- Metabolism interactions.
- Excretion interactions.

DRUG ABSORPTION INTERACTIONS.

- Absorption interactions are those where the absorption of the object drug is altered.
- Since the oral route is the one most frequently used to administer drugs, interactions influencing absorption are more likely to occur with in the ~~gastro~~ gastrointestinal tract.
- The net effect of such an interaction is:
- Faster or slower drug absorption.
- More or, less drug absorption.

FACTORS:-

a) Changes in gastrointestinal pH
b) Changes induced by chelation
c) Changes in gastrointestinal motility.

CHANGES IN GASTROINTESTINAL PH:-

- Absorption in the gut is governed by the gut PH, Lipid solubility and PKa of the drug.
- While changes in gastric PH induced by H_2 and proton pump blockers and antacids containing Al/Mg formulations have been shown to significantly reduce drug bioavailability.

- However the alteration in PH has certain clinical implications as it can result in a significantly reduce drug bioavailability.

- However, the alteration in PH has certain clinical implications as it can result in a significant reduction in the absorption of ketoconazole and itroconazole which are insoluble in water and are only ionized at low PH, Hence gastric activity plays an important part in this

interactions.

CHANGES INDUCED BY CHELATION

- The various possible drug interactions that occur due to alterations in drug absorption the most clinically significant interactions occur due to chelation or formation of insoluble complexes.

CHANGES IN GASTROINTESTINAL MOTILITY:-

- Drug that alter the stomach emptying rate can effect the rate of absorption of drugs as most of them are absorbed in the small intestine.
- Drugs with anticholinergic properties like propantheline or those alternating bowel motility like Diphenoxylate may effect the absorption of other drugs.

Eg. Propantheline increases the absorption of slow dissolving Digoxin by 30% as the reduced gut motility pass into solution

making a greater amount available for absorption but this effect is not seen with fast dissolving tablets.

- Metoclopramide on the other hand produces the opposite effect on motility and digoxin absorption.

EXAMPLES:-

Digoxin, particularly when given intravenously is an example of a drug that is well described by two ~~compar~~ compartment pharmacokinetics. After an intravenous dose is administered, plasma concentrations rise and then rapidly decline as drug distributes out of plasma and into muscle tissue.

Q4
what does heart failure means, explain the pathophysiology of heart failure.

ANSWER:-

HERT HEART FAILURE:-

Heart failure is a chronic, progressive condition in which heart muscle is unable to pump enough blood to meet the body's needs for blood and oxygen.

OR

Congestive heart failure is a chronic condition in which the heart is unable to pump a sufficient quantity of blood to meet the needs of peripheral tissues.

PATHOPHSIOLOGY OF HEART FAILURE:-

Cardiac Lesin:

- Ischemia
- infarction
- myopathy
- hypertension
- valve disease
- other

↓

Decreased Cardiac Performance
impaired pumping ability

↓

Neurohomoral Compensation
↑ sympathetic activity
↑ renin-angiotensin II
↑ Aldosterone

↓

Increased Cardiac workload due to:
↑ vascular resistance
↑ fluid volume

↓

Myocardial cell changes
structural damage
altered calcium transport

↓

Decreased Cardiac Performance
impaired pumping ability

Q:4

Part: B

Classify the drugs used for the treatment of heart failure, explain along with mechanism.

MECHANISM OF HEART FAILURE:

Heart failure begins after an index event produces an initial decline in pumping capacity of the heart. After this initial decline in pumping capacity of the heart, a variety of compensatory mechanisms are activated, including the adrenergic nervous system, the renin-angiotensin system, and the cytokine system.

TREATMENT OF HEART FAILURE:-