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QNO1::

A: What does drug interaction means and enumerate its various types.

ANSWER::

INTRODUCTION:

- ❖ IT is a situation in which a substance affects the activity of a drug when both are administered together. This action can be synergistic means when the drug's effect is increase or antagonistic which means when the drug's effect is decreased or a new effect can be produced that neither produces on its own.
- ❖ Drug interaction may be the result of various processes. These processes may include alterations in the pharmacokinetic of the drug, such as alternation in the absorption, distribution, metabolism, and excretion of a drug. Alternatively, drug interactions may be the result of the pharmacodynamic properties of the drug, e. g the co_administration of a receptor antagonist and an agonist for the same receptor.

DEFINATION::

IT is define as an alternation in the duration or magnitude of pharmacological effects of one drug produced by another drug, food, or any other substance.

TYPES ::

1. (Drug – drug interaction) interaction between drugs come to mind
2. (drug-food interaction) interactions may also exist between drugs and foods.
3. (drug-plant interaction) 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.

1: Drug-Drug interaction :

It occur when a drug interacts, or interferes, with another drug. This can alter the way one or both of the drugs act in the body, or cause unexpected side effects.

- ❖ Codeine + Paracetamol Addition(increased analgesic effect)

- ❖ Aspirin +Warfarin Synergism (excessive bleeding)
- ❖ Clavulanic acid + Amoxicillin Synergism (increased antibiotics effect)

Drug-food interactions:

A drug-food interaction happens when the food you eat affects the ingredients in a medicine you are taking so the medicine cannot work the way it should.

- ❖ Benzodiazepines +grapefruit inhibit enzymes involved in drug metabolism.
- ❖ Tetracycline's + calcium food Reduced absorption of drug.

Drug-disease interactions :

Drug condition interactions occur when a drug worsens or exacerbates an existing medical condition.

- ❖ Nasal decongestants + Hypertension increased blood pressure.
- ❖ Calcium channel blocker + Heart failure Negative inotropic activity.
- ❖ Nicotine + high blood pressure increased heart rate.

Qb: write down a detail note on Pharmacodynamics drug interaction.

ANSWER : Pharmacodynamics interactions :

It is the interaction in which the activity of the object drug at its site of action is altered by the precipitant. Such interactions may be direct or indirect.

Types of Pharmacodynamics : Two types

1: Direct Pharmacodynamics interactions 2: Indirect Pharmacodynamics interactions.

1: Direct Pharmacodynamics interactions :

In this interaction drug having similar or opposing pharmacological effects are used concurrently.

The three consequences of direct interactions are :

1: Antagonism (Antagonism : $1-1=0$):

The interacting drugs have opposing actions.

EXAMPLE: Acetylcholine and noradrenaline have opposing effects on heart rate.

2: Addition or summation (Additive effect : $1+1=2$).

The interacting drugs have similar actions and the resultant effects is the some of individual drug response.

Example: CNS depressants like sedative and hypnotics etc.

3: Synergism or potentiation synergistic effect : $1+1>2$ and potentiation effect : $1+0=2$:

It is an enhancement of action of one drug by another.

Example: Alcohol enhances the analgesics activity of aspirin.

2: Indirect Pharmacodynamics interactions :

In which both the object and the precipitant drug have unrelated effects, but the latter in some way alerts the effects but latter in some way alerts the effects of the former.

Example:

Salicylate decrease the ability of the platelets to aggregate thus impairing the Homeostasis if Warfarin induced bleeding occurs.

QNO5: A: Differentiate between general and local anesthetic, explain various stages of general anesthesia.

ANSWER : Anesthesia ::

It is a drug used to induce anesthesia or in other words, to result in a temporary loss of sensitive or awareness.

They may be divided in two broad classes.

1: General anesthesia 2: local anesthesia

Differentiate between general and local anesthesia.

1: General anesthesia :

- ❖ Type of anesthesia which result in a reversible loss of consciousness.
- ❖ It causes a person to fall asleep.
- ❖ In this type a person won't remember anything occurring during a surgery if general anesthesia is applied.
- ❖ General anesthesia can be administered as a gas form through a gas mask or intravenously.

2: Local anesthesia :

- ❖ It is applied to a specific region in the body where the procedure will be performed.
- ❖ It causes a reversible loss of sensation for a limited region of the body with out necessarily affecting consciousness.

STAGES OF ANESTHESIA :

A: Stage 1: Analgesia:

In this stage 1, the patient has decreased awareness of pain, sometimes with amnesia. Consciousness may be impaired but is not lost.

B: Stage 2: Disinhibition /excitement :

In this stage 2, the patient appears to be delirious and excited. Amnesia occurs, reflexes are enhanced, and respiration is typically irregular ; retching and incontinence may occur.

C. Stage 3: Surgical Anesthesia :

In this stage 3, the patient is unconscious and has no pain, reflexes; respiration is very regular, and blood pressure is maintained.

D. Stage 4: Medullary Depression :

In this stage 4, the patient develops severe respiratory and cardiovascular depression that requires mechanical and pharmacological support.

Q b: Write down the mechanism of action of narcotic and non-narcotic analgesics.

ANSWER : Narcotic Analgesic :

- ❖ These are a class of medicines that are used to provide relief from moderate to severe acute or chronic pain.
- ❖ This may also be called opiates, opioid analgesics, or narcotics.
- ❖ Analgesics is another name for a medicine that relieves pain.

MECHANISM OF ACTION OF NARCOTIC ANALGESIC :

- ❖ Narcotic produce their actions at a cellular level by activating opioid receptors. Opioids act by binding to opioid receptors, which are found principally in the central and peripheral nervous systems and the Gastrointestinal tract. These receptors mediate both the psychoactive and the somatic effect of opioids.
- ❖ opioid drugs include partial agonists, like the anti-diarrhea drug loperamide and antagonists like naloxegol for opioid-induced constipation, which do not cross the blood-brain barrier, but can displace other opioids from binding to those receptors.

Non- Narcotic Analgesic :

- ❖ These are the medications used to control pain and inflammation.
- ❖ They are available at drugstore without a prescription or by prescription when given at higher doses.
- ❖ Some of these medications can be given during surgery to reduce post-surgical pain and lessen the need for narcotics.

Mechanism of non-narcotic analgesics :

- ❖ Depression of cyclooxygenases activity.
- ❖ Decreasing of prostaglandins synthesis in peripheral tissues and in Central nervous system.
- ❖ Decreasing of sensitivity of nervous endings and depression of transmission of nociceptive impulses on the level of CNS structures.
- ❖ Pain relieving action of Non-opioid analgesics is partly connected with their anti-inflammatory activity.

QNO2 Part a: Differentiate between hypoglycemic and hyperglycemic agents with examples.

- ❖ **ANSWER : HYPOGLYCEMIA :** Drugs used in diabetes treat diabetes mellitus by altering the glucose level in blood.
- ❖ With the exception of insulin, exenatide, liraglutide and pramlintide, all are administered orally and are thus also called oral hypoglycemic agent or oral antihyperglycemic agents.

- ❖ The drugs which are used to lower blood sugar are called hypoglycemic agent.

Examples:

1. Sulphonylureas :: e. g(Glibenclamide, Gliclazide, Glimepride).
2. Biguanide :: e. g(Metformin).
3. Thiazolidinediones :: e. g(Rosiglitazone)
4. Meglitinide :: e. g(Netaglinide)
5. Alpha-glucosidase inhibitors: e. g(Acarbose).

Hyperglycemic Agent:

- ❖ A drugs which increases the blood glucose level, when there is decrease in blood glucose level.
- ❖ Examples: Metformin is an oral hyperglycemic agent.

Q2 part b: what is emesis and antiemetic drugs give examples.

ANSWER :

- ❖ Emesis :: It is the medical term for vomiting. Vomiting is the act of stomach contents exiting out of the mouth.
- ❖ Emesis drugs are those which induce nausea and vomiting.
- ❖ These drugs are used especially in a cases of drug overdose or poisoning.

Examples : Emetine, Diltiazem, Amiodarone etc.

Antiemetic drugs:

- ❖ It is a drug that is effective against vomiting and nausea.
- ❖ Antiemetic are typically used to treat motion sickness and side effects of opioid analgesics, general anesthetic and chemotherapy directed against cancer.

Examples of antiemetic drugs :

- ❖ Serotonin Antagonists: Zofran.
- ❖ Dopamine Antagonists: Compazine, Phenergan, Inapsine, Reglan.
- ❖ Cannabinoids: Marinol, Cesamet.

Q2 part c: What kind of drugs are used for cough and sputum, with given examples.

ANSWER :

- ❖ Drugs used for cough :
Codeine, Dihydrocodein, Nondependence, Dextromethorphan, Cloperastine, and Pentoxyverine.
- ❖ Drugs used for sputum :
Acetylcysteine, mecystine, carbocistine, Dornas alfa.

QNO3 a: Enumerate different target for antibiotics:

ANSWER : There are three main antibiotics targets in bacteria :

- ❖ The cell wall or membranes that surrounds the bacterial cell.
- ❖ The machineries that makes the nucleic acids DNA and RNA.
- ❖ The machinery that produces protein(the ribosome and associated protein).

QNO3 Part b : Explain viral replication process in detail.

ANSWER: VIRAL REPLICATION :

Adsorption :

Initially, the virus attaches or adsorbs to the surface of the host cell. Most viruses are attached to the host cell because of the interaction between proteins on the outer surface of the virus and receptor like protein on the host cell membrane.

Penetration and Uncoating:

The virus enters the host cell by passing directly through the cell membrane or by fusing with the host cell membrane and releasing the viral genetic material to the host cell.

Biosynthesis:

When viral genetic material is released within the host cell, the virus takes control of the cell's molecular synthesizing machinery to initiate the Biosynthesis of new viral enzymes and proteins.

Maturation and Release:

The component parts of the virus (the genetic core and surrounding shell) are assembled into mature viruses and released from the host cell.

QNO4 Part a: classify Anti-hypersensitive drugs with examples :

ANSWER : Classification of antihypertensive drugs:

1. Diuretics

Examples :

- Thiazides and Congeners.
- Loop Diuretics.
- Potassium – sparing Diuretics.

2. Sympatholytic drugs:

- Centrally acting antiadrenergic agents.
- Alpha adrenergic blockers.
- Beta adrenergic blockers.
- Alpha-beta adrenergic blockers.

3. Vasodilators:

- Nitric oxide releasers.
- Potassium channel openers.
- Calcium channel blockers.

- D1-dopamine receptor
- 4. Angiotensin inhibitors and antagonists
 - Angiotensin converting Enzyme (ACE) inhibitors.
 - Angiotensin receptor antagonists.

QNO4 part b: What are the causes and drug therapy of various kinds of angina pectoris.

ANSWER :

❖ **ANGINA PECTORIS:**

IT is the medical term for chest pain or discomfort due to coronary heart disease. It occurs when the heart muscles doesn't get as much blood as it needs. This usually happens because one or more of the heart's arteries is narrowed or blocked, and also called Ischemia.

❖ **Causes :**

Angina, occurs when the flow of blood through coronary arteries to the heart muscle is insufficient to meet the heart's oxygen demands, such as during physical activity.

- ❖ It is also caused because of uncontrolled diabetes.
- ❖ High level of cholesterol.
- ❖ Obesity
- ❖ Smoking
- ❖ Having a history of cardiovascular disease.

➤ **Therapy for Angina pectoris :**

- **Aspirin.** Aspirin and other anti-platelet medications reduces the ability of your blood to clot, making it easier for blood to flow by through narrow heart arteries.
- **Nitrates**
- **Beta blockers**
- **Statins**
- **Calcium channel blockers.**

THANK YOU

THE END.

