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PHARMACOKINETICS

1- Pharmacokinetics is:

a) The study of biological and therapeutic effects of drugs

b) The study of absorption, distribution, metabolism and excretion of drugs

c) The study of mechanisms of drug action

d) The study of methods of new drug development

Answer: B

2- What does "pharmacokinetics" include?

a) Pharmacological effects of drugs

b) Unwanted effects of drugs

c) Chemical structure of a medicinal agent

d) Distribution of drugs in the organism

Answer: D

3- What does "pharmacokinetics" include?

a) Localization of drug action

b) Mechanisms of drug action

c) Excretion of substances

d) Interaction of substances

Answer: C

4- The main mechanism of most drugs absorption in GI tract is:

a) Active transport (carrier-mediated diffusion)

b) Filtration (aqueous diffusion)

c) Endocytosis and exocytosis

d) Passive diffusion (lipid diffusion)

Answer: D

5- What kind of substances can't permeate membranes by passive diffusion?

a) Lipid-soluble

b) Non-ionized substances

c) Hydrophobic substances

d) Hydrophilic substances

Answer: D

6-A hydrophilic medicinal agent has the following property:

a) Low ability to penetrate through the cell membrane lipids

b) Penetrate through membranes by means of endocytosis

c) Easy permeation through the blood-brain barrier

d) High reabsorption in renal tubules

Answer: A

7-What is implied by «active transport»?

a) Transport of drugs trough a membrane by means of diffusion

b) Transport without energy consumption

c) Engulf of drug by a cell membrane with a new vesicle formation

d) Transport against concentration gradient

Answer: D

8-What does the term “bioavailability” mean?

a) Plasma protein binding degree of substance

b) Permeability through the brain-blood barrier

c) Fraction of an uncharged drug reaching the systemic circulation following any route administration

d) Amount of a substance in urine relative to the initial doze

Answer: C

9-The reasons determing bioavailability are:

a) Rheological parameters of blood

b) Amount of a substance obtained orally and quantity of intakes

c) Extent of absorption and hepatic first-pass effect

d) Glomerular filtration rate

Answer: C

10- Which route of drug administration is most likely to lead to the first-pass effect?

a) Sublingual

b) Oral

c) Intravenous

d) Intramuscular

Answer: B

11- What is characteristic of the oral route?

a) Fast onset of effect

b) Absorption depends on GI tract secretion and motor function

c) A drug reaches the blood passing the liver

d) The sterilization of medicinal forms is obligatory

Answer: B

12- Pick out the parenteral route of medicinal agent administration:

a) Rectal

b) Oral

c) Sublingual

d) Inhalation

Answer: D

13- Most of drugs are distributed homogeneously.

a) True

b) False

Answer: B

14- The volume of distribution (Vd) relates:

a) Single to a daily dose of an administrated drug

b) An administrated dose to a body weight

c) An uncharged drug reaching the systemic circulation

d) The amount of a drug in the body to the concentration of a drug in plasma

Answer: D

15- For the calculation of the volume of distribution (Vd) one must take into account:

a) Concentration of a substance in plasma

b) Concentration of substance in urine

c) Therapeutical width of drug action

d) A daily dose of drug

Answer: A

16- A small amount of the volume of distribution is common for lipophylic substances easy penetrating through barriers and

widely distributing in plasma, interstitial and cell fluids:

a) True

b) False

Answer: B

17- The term "biotransformation" includes the following:

a) Accumulation of substances in a fat tissue

b) Binding of substances with plasma proteins

c) Accumulation of substances in a tissue

d) Process of physicochemical and biochemical alteration of a drug in the body

Answer: D

18- Biotransformation of the drugs is to render them:

a) Less ionized

b) More pharmacologically active

c) More lipid soluble

d) Less lipid soluble

Answer: D

19- Tick the drug type for which microsomal oxidation is the most prominent:

a) Lipid soluble

b) Water soluble

c) Low molecular weight

d) High molecular weight

Answer: A

20- Pick out the right statement:

a) Microsomal oxidation always results in inactivation of a compound

b) Microsomal oxidation results in a decrease of compound toxicity

c) Microsomal oxidation results in an increase of ionization and water solubility of a drug

d) Microsomal oxidation results in an increase of lipid solubility of a drug thus its excretion from the organism is facilitated

Answer: C

21- Metabolic transformation (phase 1) is:

a) Acetylation and methylation of substances

b) Transformation of substances due to oxidation, reduction or hydrolysis

c) Glucuronide formation

d) Binding to plasma proteins

Answer: B

22- Conjugation is:

a) Process of drug reduction by special enzymes

b) Process of drug oxidation by special oxidases

c) Coupling of a drug with an endogenous substrate

d) Solubilization in lipids

Answer: C

23- Which of the following processes proceeds in the second phase of biotransformation?

a) Acetylation

b) Reduction

c) Oxidation

d) Hydrolysis

Answer: A

24- Conjugation of a drug includes the following EXCEPT:

a) Glucoronidation

b) Sulfate formation

c) Hydrolysis

d) Methylation

Answer: C

25- Metabolic transformation and conjugation usually results in an increase of a substance biological activity:

a) True

b) False

Answer: B

26- Half life (t 1⁄2) is the time required to:

a) Change the amount of a drug in plasma by half during elimination

b) Metabolize a half of an introduced drug into the active metabolite

c) Absorb a half of an introduced drug

d) Bind a half of an introduced drug to plasma proteins

Answer: A

27- Half life (t 1⁄2) doesn't depend on:

a) Biotransformation

b) Time of drug absorption

c) Concentration of a drug in plasma

d) Rate of drug elimination

Answer: B

28- The most rapid eliminated drugs are those with high glomerular filtration rate and actively secreted but aren't passively

reabsorbed:

a) True

b) False

Answer: A

29- Systemic clearance (CLs) is related with:

a) Only the concentration of substances in plasma

b) Only the elimination rate constant

c) Volume of distribution, half life and elimination rate constant

d) Bioavailability and half life

Answer: C

PHARMACODYNAMICS:

1- Pharmacodynamics involves the study of following EXCEPT:

a) Biological and therapeutic effects of drugs

b) Absorption and distribution of drugs

c) Mechanisms of drug action

d) Drug interactions

Answer: B

2- Pharmacodynamics involves the study of following?

a) Mechanisms of drug action

b) Biotransformation of drugs in the organism

c) Distribution of drugs in the organism

d) Excretion of drug from the organism

Answer: A

3- Pharmacodynamics involves the following?

a) Information about main mechanisms of drug absorption

b) Information about unwanted effects

c) Information about biological barriers

d) Information about excretion of a drug from the organism

Answer: B

4- Pick out the answer which is the most appropriate to the term "receptor"

a) All types of ion channels modulated by a drug

b) Enzymes of oxidizing-reducing reactions activated by a drug

c) Active macromolecular components of a cell or an organism which a drug molecule has to combine with in

order to elicit its specific effect

d) Carriers activated by a drug

Answer: C

5- What does “affinity” mean?

a) A measure of how tightly a drug binds to plasma proteins

b) A measure of how tightly a drug binds to a receptor

c) A measure of inhibiting potency of a drug

d) A measure of bioavailability of a drug

Answer: B

6- Target proteins which a drug molecule binds are:

a) Only receptors

b) Only ion channels

c) Only carriers

d) All of the above

Answer: D

7- An agonist is a substance that:

a) Interacts with the receptor without producing any effect

b) Interacts with the receptor and initiates changes in cell function, producing various effects

c) Increases concentration of another substance to produce effect

d) Interacts with plasma proteins and doesn’t produce any effect

Answer: B

8- If an agonist can produce maximal effects and has high efficacy it’s called:

a) Partial agonist

b) Antagonist

c) Agonist-antagonist

d) Full agonist

Answer: D

9- If an agonist can produce submaximal effects and has moderate efficacy it’s called:

a) Partial agonist

b) Antagonist

c) Agonist-antagonist

d) Full agonist

Answer: A

10- An antagonist is a substance that:

a) Binds to the receptors and initiates changes in cell function, producing maximal effect

b) Binds to the receptors and initiates changes in cell function, producing submaximal effect

c) Interacts with plasma proteins and doesn't produce any effect

d) Binds to the receptors without directly altering their functions

Answer: D

11- A competitive antagonist is a substance that:

a) Interacts with receptors and produces submaximal effect

b) Binds to the same receptor site and progressively inhibits the agonist response

c) Binds to the nonspecific sites of tissue

d) Binds to one receptor subtype as an agonist and to another as an antagonist

Answer: B

12- The substance binding to one receptor subtype as an agonist and to another as an antagonist is called:

a) Competitive antagonist

b) Irreversible antagonist

c) Agonist-antagonist

d) Partial agonist

Answer: C

13- 013. Irreversible interaction of an antagonist with a receptor is due to:

a) Ionic bonds

b) Hydrogen bonds

c) Covalent bonds

d) All of the above

Answer: C

13- Tick the second messenger of G-protein-coupled (metabotropic) receptor:

a) Adenylyl cyclase

b) Sodium ions

c) Phospholipase C

d) cAMP

Answer: D

14- Tick the substances whose mechanisms are based on interaction with ion channels

a) Sodium channel blockers

b) Calcium channel blockers

c) Potassium channels activators

d) All of the above

Answer: D

15- All of the following statements about efficacy and potency are true EXCEPT:

a) Efficacy is usually a more important clinical consideration than potency

b) Efficacy is the maximum effect of a drug

c) Potency is a comparative measure, refers to the different doses of two drugs that are needed to produce the same

effect

d) The ED50 is a measure of drug's efficacy

Answer: D

16- Give the definition for a therapeutical dose:

a) The amount of a substance to produce the minimal biological effect

b) The amount of a substance to produce effects hazardous for an organism

c) The amount of a substance to produce the required effect in most patients

d) The amount of a substance to accelerate an increase of concentration of medicine in an organism

Answer: C

17- Pick out the correct definition of a toxic dose:

a) The amount of substance to produce the minimal biological effect

b) The amount of substance to produce effects hazardous for an organism

c) The amount of substance to produce the necessary effect in most of patients

d) The amount of substance to fast creation of high concentration of medicine in an organism

Answer: B

18- Which effect may lead to toxic reactions when a drug is taken continuously or repeatedly?

a) Refractoriness

b) Cumulative effect

c) Tolerance

d) Tachyphylaxis

Answer: B

19- What term is used to describe a more gradual decrease in responsiveness to a drug, taking days or weeks to develop?

a) Refractoriness

b) Cumulative effect

c) Tolerance

d) Tachyphylaxis

Answer: C

20- What term is used to describe a decrease in responsiveness to a drug which develops in a few minutes?

a) Refractoriness

b) Cumulative effect

c) Tolerance

d) Tachyphylaxis

Answer: D

21- Tachyphylaxis is:

a) A drug interaction between two similar types of drugs

b) Very rapidly developing tolerance

c) A decrease in responsiveness to a drug, taking days or weeks to develop

d) None of the above

Answer: B

22- Tolerance and drug resistance can be a consequence of:

a) Drug dependence

b) Increased metabolic degradation

c) Depressed renal drug excretion

d) Activation of a drug after hepatic first-pass

Answer: D

21- Tolerance and drug resistance can be a consequence of:

a) Change in receptors, loss of them or exhaustion of mediators

b) Increased receptor sensitivity

c) Decreased metabolic degradation

d) Decreased renal tubular secretion

Answer: A

22- Tolerance develops because of:

a) Diminished absorption

b) Rapid excretion of a drug

c) Both of the above

d) None of the above

Answer: D

23- What does the term “potentiation” mean?

a) Cumulative ability of a drug

b) Hypersensitivity to a drug

c) Fast tolerance developing

d) Intensive increase of drug effects due to their combination

Answer: D

24- The types of antagonism are:

a) Summarized

b) Potentiated

c) Additive

d) Competitive

Answer: D

25- The term “chemical antagonism” means that:

a) two drugs combine with one another to form an inactive compound

b) two drugs combine with one another to form a more active compound

c) two drugs combine with one another to form a more water soluble compound

d) two drugs combine with one another to form a more fat soluble compound

Answer: A

26- A teratogenic action is:

a) Toxic action on the liver

b) Negative action on the fetus causing fetal malformation

c) Toxic action on blood system

d) Toxic action on kidneys

Answer: B

27- Characteristic unwanted reaction which isn’t related to a dose or to a pharmacodynamic property of a drug is called:

a) Idiosyncrasy

b) Hypersensitivity

c) Tolerance

d) Teratogenic action

Answer: B

28- Idiosyncratic reaction of a drug is:

a) A type of hypersensitivity reaction

b) A type of drug antagonism

c) Unpredictable, inherent, qualitatively abnormal reaction to a drug

d) Quantitatively exaggerated response

Answer: C

29- Therapeutic index (TI) is:

a) A ratio used to evaluate the safety and usefulness of a drug for indication

b) A ratio used to evaluate the effectiveness of a drug

c) A ratio used to evaluate the bioavailability of a drug

d) A ratio used to evaluate the elimination of a drug

Answer: A

30- What is the type of drug-to-drug interaction which is connected with processes of absorption, biotransformation, distribution and excretion?

a) Pharmacodynamic interaction

b) Physical and chemical interaction

c) Pharmaceutical interaction

d) Pharmacokinetic interaction

Answer: D

31- What is the type of drug-to-drug interaction which is the result of interaction at receptor, cell, enzyme or organ level?

a) Pharmacodynamic interaction

b) Physical and chemical interaction

c) Pharmaceutical interaction

d) Pharmacokinetic interaction

Answer: A