Pharmacology

2025-2024

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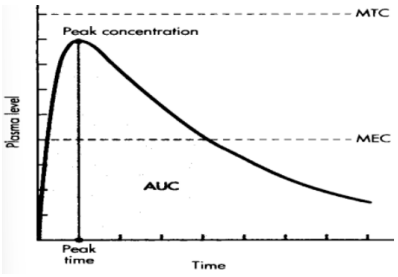
ARKAN ACADEMY

Past Papers

1. Which of the following make the urine alkaline?

   A. KCOOH
   B. $NaHCO_2$
   C. Paracetamol
   D. Halothane

2. All of the following statements regarding this figure are correct except:



   A. It may represent an orally administered drug
   B. AUC describes the extent of bioavailability for drugs
   C. T_{max} is the time needed to reach C_{max}, and it describes the rate of absorption for drugs
   D. In order for drugs to produce therapeutic effect, they must be above MTC
   E. None of the above

3. The most important mechanism of permeation of drug molecules:

   A. Active transport.
   B. Carrier mediated transport
   C. Lipid diffusion.
   D. Aqueous diffusion.

4. A 23 yo male had ingested toxic dose of morphine (weak base with pk_b=7.9), you were the clinician in the emergency department, after administering an antidote the patient is still not responding, what will you do?

   A. Give him sodium bicarbonate to acidify the urine
   B. Give him vitamin C to alkalinize the urine
   C. Give him ammonium chloride to alkalinize the urine
   D. Give him Vitamin C to acidify the urine
   E. None of the above

5. Which one of the following statements best describes drug absorption:

   A. The tightness between drug and its receptor
   B. Irreversible transport from site of administration to the bloodstream
   C. Drug leaving the blood to peripheral tissue
   D. It is inversely Proportional to drug concentration in plasma

6. Binding of a drug to plasma proteins tends to?

   A. Decreases its half-life
   B. Decreases its rate of glomerular filtration
   C. Increases its rate of biotransformation
   D. Increases its concentration in plasma

7. Which of the following is not an example of drug conjugation:

   A. Glucuronidation
   B. Sulfation
   C. Hydrolysis
   D. Methylation

8. All of the following factors if increased may increase lipid diffusion except:

   A. Concentration gradient
   B. Thickness of membranes
   C. Area of absorption
   D. Blood supply

9. All of the following statements with regards to Drug Binding with Plasma proteins are correct except:

   A. Albumin is the most important drug binding protein
   B. The bound from of drug acts as reservoirs and cannot cross membranes
   C. If we decrease the amount of plasma proteins, the total drug concentration in plasma will remain the same
   D. The more a drug binds to plasma proteins, the longer its $t_{1/2}$

10. What is characteristic of the sublingual route?

   A. Fast drug absorption
   B. Drug exposed to gastric secretion
   C. Drug exposed to more prominent liver metabolism
   D. Drug can be administrated in a variety of doses

11. Factor(s) that influence the bioavailability of drugs:

   A. First-pass hepatic metabolism
   B. Solubility of the drug
   C. Chemical instability in GIT
   D. All of the above

12. All of the following about passive absorption (lipid-diffusion) is true EXCEPT?

   A. The driving force is concentration gradient
   B. Doesn't involve a carrier
   C. The process shows a low structural specificity
   D. The process is saturable

13. Some Drugs show zero-order kinetics of elimination, which is correct:

   A. They Are more common than those showing first order kinetics
   B. They Decrease in concentration exponentially with time
   C. Amount of drug eliminated is independent of dose
   D. Show constant fraction of the drug eliminated per unit time

14. Which one of the following statements best describes drug distribution

A. The tightness between a drug and its receptor
B. Irreversible transport from site of administration to the bloodstream
C. Drug leaving the blood to peripheral tissue.
D. It is inversely Proportional to drug concentration in plasma

15. The oral route of drug administration tends to be associated with all of the following EXCEPT?

A. Relative safety
B. Rapid response
C. Convenience
D. Incomplete absorption

16. If 87.5% of a drug is eliminated via first order kinetics in 15 hours. Half-life of this drug is expected to be?

A. 5
B. 10
C. 15
D. 45
E. 30

17. As part of phase II reactions, Sulfotransferases utilize which one of the active intermediates:

A. Glutathione
B. PAPS
C. Acetyl CoA
D. UDP-Glucuronic acid

18. A 22 yo female came to the emergency department after ingesting toxic dose of paracetamol one hour ago, what will you give her:

A. Activated charcoal only
B. Activated charcoal and N-acetyl cysteine
C. N-acetyl cysteine only
D. I won’t give her anything since she is stable now

19. In terms of drug metabolism, one of the following Cytochromes is the most important:

A. CYP1A2
B. CYP2C9
C. CYP3A4
D. CYP2D6

20. Desulfuration is an example of

A. Oxidation as part of Phase I reactions
B. Reduction as part of Phase I reactions
C. Oxidation as part of Phase II reactions
D. Reduction as part of Phase II reactions

21. All of the following statements about IV route of administration of drugs are correct except:

A. It has rapid onset of action
B. There is no first pass effects
C. Only aqueous solutions may be injected IV
D. It can be utilized without aseptic techniques
E. It can be used in unconscious patients

22. Half-life of drug doesn't depend on?

A. Biotransformation
B. Time of drug absorption
C. Concentration of a drug in plasma
D. Rate of drug elimination

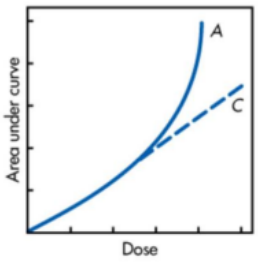
23. Steady state, all of the following statements are correct except:

A. It is reached after 4 to 5 half-lives
B. In order to reach it quickly, a maintenance dose can be used
C. If we double drug concentration, we will need only 2 half-lives to reach SS
D. More than one of the above
E. None of the above

24. A 34 yo female came to your clinic with certain complaints, you chose to prescribe her a drug that is activated by CYP450 system, she told you "Oh doctor I forgot to tell you that I also take St.John's wort because I feel depressed" what do you think will happen to the level of the medication the doctor prescribed:

A. It will remain the same
B. It will be elevated
C. It will be decreased
D. None of the above

25. With regards to the following curve, which one of the following statements is incorrect:



A. AUC of drug A is greater than AUC of drug C
B. The drug A undergoes zero-order elimination
C. Drugs with first-order elimination never become zero-order
D. None of the above

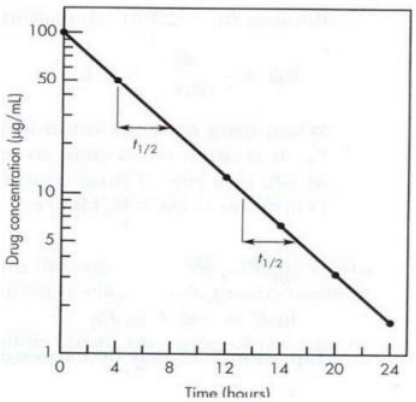
26. All of the following statements related to the binding of drugs by plasma proteins are correct EXCEPT?

A. Bound drug is unable to diffuse into tissue until it becomes unbound
B. Displacement of the bound drug by another drug can increase the effects of a given dosage of the first drug
C. Bound drug is the pharmacologically active part of the drug
D. None of the above

27. If we place Aspirin which is a weak acid with pka (3.5) in the stomach (pH=2), which one of the following statement/s is/are incorrect:

A. The drug with be mostly in the protonated form
B. The drug will be water-soluble and thus won't be absorbed from the stomach
C. The drug will be mostly in the ionized form
D. More than one of the above
E. None of the above

28. With regards to the following curve, answer the following questions:



a. This drug is administered:

A. Orally
B. IM
C. IV
D. Rectally

b. The half-life is:

A. 2 hrs
B. 4 hrs
C. 6 hrs
D. 8 hrs

c. What kind of elimination this drug undergoes:

A. Zero order
B. First order
C. Flow dependent
D. None of the above

29. Bioavailability is:

A. The fraction of drug that gets absorbed
B. The fraction of the uncharged active drug reaching the systemic circulation ,following drug administration ,irrespective of the route
C. The fraction that gets metabolized
D. The fraction that gets eliminated

30. If the V_d for drug A is 40 L, and its elimination rate constant is 2.5/hour then the clearance is:

A. 40 L/min
B. 100 L/min
C. 40 L/hour
D. 100 L/hour

31. What is the V_d of drug A if 300mg of it is administered IV, then the C0 was 0.005g/ml :

A. 60 L
B. 30 L
C. 30 mL
D. 60 mL

32. What is $t_{½}$ if the V_D=200 L and CL=20L/hour:

A. 5 hours
B. 7 hours
C. 9 hours
D. 10 hours

33. Asthma is reactive airway disease in which patients suffer from recurrent attacks of bronchoconstriction, knowing that B2 receptor is present in the airways and its activation leads to bronchodilation, what will you prescribe for your patient:

A. B2 agonist
B. B2 partial agonist
C. B2 antagonist
D. None of the above

34. When two drugs with the same effect are given together and produce an effect that is greater in magnitude than the sum of their effects when the drugs are given individually, we call this?

A. Competitive drug effect
B. Synergistic drug effect
C. Additive drug effect
D. Potentiation drug effect

35. If you want to pick up a drug that can act as agonist or antagonist in different situations, what will you pick up:

A. Full agonist
B. Partial agonist
C. Full antagonist
D. None of the above

36. Paracetamol if ingested in toxic doses will result in:

A. Cardio toxicity
B. Nephrotoxicity
C. Hepatotoxicity
D. All of the above

37. If a Drug A which has nothing to do with hypertension is administered with Drug B which treats hypertension, the results showed that there effect on hypertension is greater than drug A alone, what do we call this effect:

A. Competitive drug effect
B. Synergistic drug effect
C. Additive drug effect
D. Potentiation drug effect

38. All of the following are considered Factors that affect drug Toxicity and Interactions except:

A. Age
B. Genetic factors
C. Polypharmacy
D. None of the above

39. Salivary secretions are sometimes bothering for dentists, if you know that activation of muscuranic receptors are responsible for this effect then what should dentists give their patients:

A. Muscarinic agonist
B. Muscarinic partial agonist
C. Muscarinic antagonist
D. None of the above.

40. If a drug competes with normal endogenous substances for a receptor, what do we call this drug

A. Partial agonist
B. Agonist
C. Non-competitive antagonist
D. Competitive antagonist

41. Which one of the following measures best assesses drug safety

A. Drug efficacy
B. Drug potency
C. Therapeutic index
D. Chemical antagonism

42. One of the following drugs should be used with caution in non-compliant patients since it has narrow therapeutic window:

A. Paracetamol
B. Warfarin
C. Penicillin
D. None of the above

43. One of the following agents works via activating enzyme-linked receptors:

A. Morphine
B. Insulin
C. B-Blocker
D. None of the above.

44. If drug A is more potent than drug B, this means:

A. Drug A produces much greater effect than B
B. Drug A is a prodrug
C. We need smaller dose of drug A to produce the same effect of larger dose of drug B
D. All of the above.

Dr. Jacob Questions

1. The initial plasma concentration of a drug was found to be 2 mg/L following an intravenous dose of 300 mg. Which of the following is its apparent volume of distribution?

   A. 15 L
   B. 150 L
   C. 300 L
   D. 500 L
   E. 1000 L

2. If a drug has a clearance of 10 L/hr and a volume of distribution is 70 L, then t½ of elimination of the drug is around:

   A. 80 hrs
   B. 20 hrs
   C. 10 hrs
   D. 5 hrs
   E. 2 hrs

3. A drug has a volume of distribution of 1500 L and a half-life of elimination of around 23 hours. Its clearance will be about:

   A. 5 L/hour
   B. 15 L/hour
   C. 30 L/hour
   D. 45 L/hour
   E. 90 L/hour

4. If the desired steady-state plasma concentration of the drug is 15 mg/L, and its clearance is 10 L/hour, the maintenance dose of the drug would be:

   A. 10 mg every hour
   B. 25 mg every hour
   C. 75 mg every hour
   D. 150 mg every hour
   E. 300 mg every hour

5. A drug has a therapeutic plasma concentration of 15 mg/L and a volume of distribution of 200 L. The loading dose of this drug should be:

   A. 250 mg
   B. 500 mg
   C. 1000 mg
   D. 2000 mg
   E. 3000 mg

☆ Bioavailability (F) = f. (1 − ER)

$$ER = \frac{C_i - C_o}{C_i}$$

☆ $V_d = \frac{dose}{C_p}$

Rate of Elemination

- first order: k (constant)
- Zero order: $Rate = \frac{V_{max} \cdot C}{K_m + C}$

☆ $k \times t_{1/2} = 0.693$

$$CL = \frac{\text{Rate of Elimination}}{C_p}$$

first order → $CL = k \times V_d$

$$CL_R = \frac{C_u \cdot V}{C_p}$$

$$CL_H = Q \times ER$$

$$MD = CL \cdot C_{ss}$$

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