F MBChB

COPPERBELT UNIVERSITY

MICHEAL CHILUFYA SATA SCHOOL OF MEDICINE

MBS 230 –THERAPEUTICS END OF TERM 1 TEST

Duration: 2 HRS

Instructions.

1. **Write student/serial numbers on all answer sheets**
2. **Section A: Select one best option, please use the attached answer grid.**
3. **Section B and C should be answered on separate answer sheets**
4. **Submit both question paper and answer sheets at the end of the test**

SECTION A (each question carries 1 mark)

1. In irreversible antagonism,
    a. The dose response curve shifts from left to right with a reduction in maximum response
    b. The dose response curve shifts from left to right with no reduction in the maximum response
    c. There is reduction in the maximum response with no shift from the origin
    d. There is no reduction in the maximum response and no shift

2. Which of the following is NOT a type of antagonist?
    a. Chemical antagonist
    b. Physiological or functional antagonist
    c. Inverse agonist
    d. Inverse antagonist

3. Which of the following statements is NOT TRUE for ionotropic receptor- ligand interaction?
    a. Ligand does not directly control channel
    b. Fast action
    c. Transient
    d. The receptors are ion channels
4. Which of the following routes of drug administration is NOT for local purposes?
    a. Intrathecal administration
    b. Sublingual administraton
    c. Conjuctival administration
    d. Buccal administration

5. Which of the following is NOT a disadvantage for drug administration through the rectal route?
    a. Unpleasant way of application
    b. Drug undergoes first pass metabolism
    c. Increased bacteremia risk for immunosuppressive patients
    d. Decreased absorption in diarrhea and constipation

6. G- proteins are basically made up of
    a. 3 subunits
    b. 5 subunits
    c. 7 sub units
    d. 4 sub units

7. An… .....is the term is used to describe a drug that binds to a receptor, fails to activate it and leads to a drop in inherent biological activity.
    a. agonist
    b. antagonist
    c. partial agonist
    d. inverse agonist

8. An… .....is the term is used to describe a drug that has the same effect on a receptor as the endogenous chemical messenger.
    a. agonist
    b. antagonist
    c. partial agonist
    d. inverse agonist

9. The margin of safety of a drug can be mathematically defined as:
    a. The ratio of LD_{50} to ED_{50}
    b. The ratio of $LD_{99.9}$ to $ED_{0.1}$
    c. The ratio of $LD_{0.1}$ to $ED_{99.9}$
    d. The ratio of ED_{99} to ED_{50}

10. Second messengers are very key in the signal transduction involving G-protein coupled receptors. The enzyme adenylate cyclase, an enzyme involved in GPCR signal transduction is useful in:
    a. the conversion of ATP to cyclic AMP
    b. the conversion of cyclic AMP to AMP
    c. the conversion of cyclic AMP to ATP
    d. the conversion of AMP to cyclic AMP

11. The following statements listing characteristics, in each case, of a particular route of drug administration are correct, EXCEPT:
    a. Intravenous administration provides a rapid response
    b. Intramuscular administration requires a sterile technique
    c. Inhalation provides slow access to the general circulation
    d. Subcutaneous administration may cause local irritation

12. Which of the following can be an advantage of intramuscular route of drug administration over intravenous route?
    a. Only water solutions can be injected
    b. Oily solutions can be injected
    c. Opportunity of hypertonic solution injections
    d. The action develops slower, than at oral administration

13. What kind of substances can't permeate membranes by passive diffusion?
    a. Lipid-soluble
    b. Non-ionized substances
    c. Hydrophobic substances
    d. Hydrophilic substances

14. Which of the following statements is characteristic of the oral route?
    a. Fast onset of action
    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

15. For transport of drug molecules across biological membranes through facilitated diffusion, the following are true, except:
    a. It is saturable
    b. Requires energy
    c. Does not require energy
    d. Occurs by carrier proteins

16. What phenomenon can occur in case of using a combination of drugs?
    a. Tolerance
    b. Tachyphylaxis
    c. Accumulation
    d. Synergism

17. If two drugs with the same effect, taken together, produce an effect that is equal in magnitude to the sum of the effects of the drugs given individually, it is called as:
    a. Antagonism
    b. Potentiation
    c. Additive effect
    d. None of the above
18. 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
19. Concerning absorption of a said drug, the dosage formulation with slowest absorption among the underlisted will be:
    a. Suspension
    b. Solution
    c. Sustained release tablets
    d. Capsules

20. 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

21. One of the following statements can be an advantage of intramuscular route of drug administration over intravenous routes?
    a. Only water solutions can be injected
    b. Oily solutions can be injected
    c. Opportunity of hypertonic solution injections
    d. The action develops slower, than at oral administration

22. In which of the enteral route is passage through the liver minimized?
    a. Oral
    b. Transdermal
    c. Rectal
    d. Intraduodenal

23. For transport of drug molecules across biological membranes through facilitated diffusion, the following are true, EXCEPT:
    a. It is saturable
    b. Requires energy
    c. Does not require energy
    d. Occurs by carrier proteins

24. The clinically used local anaesthetics have the following common features except:
A. They are amphiphilic weak bases
B. They are used for surgery in non-cooperative patients
C. In their use, care of vital functions is generally not needed
D. They are safer than general anaesthetics in patients with respiratory and cardiovascular disease

25. The local anaesthetics having amide linkage differ from those having ester linkage in that the amide linked local anaesthetics:
A. Are not surface anaesthetics
B. Have a shorter duration of action
C. Are degraded in the plasma
D. Do not show cross-sensitivity with ester linked local anaesthetics

26. The following is not true of local anaesthetics:
A. The local anaesthetic is required in the unionized form for penetrating the neuronal membrane
B. The local anaesthetic approaches its receptor only from the intraneuronal face of the Na+ channel
C. The local anaesthetic binds to its receptor mainly when the Na+ channel is in the resting state
D. The local anaesthetic combines with its receptor in the ionized cationic form

27. Local anaesthetics block nerve conduction by:
A. Blocking all cation channels in the neuronal membrane
B. Hyperpolarizing the neuronal membrane
C. Interfering with depolarization of the neuronal membrane
D. Both 'B' and 'C' are correct

28. Which sensation is blocked first by low concentrations of a local anaesthetic:
A. Pain
B. Temperature
C. Touch
D. Deep pressure

29. Injection of adrenaline along with a local anaesthetic serves the following purpose:
A. Lowers the concentration of the local anaesthetic to produce nerve block
B. Prolongs the duration of local anaesthesia
C. Increases the anaesthetised area
D. Reduces the local toxicity of the local anaesthetic

30. Toxicity of local anaesthetics involves the following organs except:
    A. Heart
    B. Brain
    C. Kidney
    D. Skin and subcutaneous tissue

31. The local anaesthetic with the longest duration of action is:
    A. Procaine
    B. Chloroprocaine
    C. Lignocaine
    D. Dibucaine

32. Which of the following is a poor surface anaesthetic:
    A. Procaine
    B. Lignocaine
    C. Tetracaine
    D. Benoxinate

33. Which of the following statements is true for lignocaine:
    A. It is an ester-linked local anaesthetic
    B. It is not likely to exhibit cross-sensitivity with procaine
    C. It has a shorter duration of action than procaine
    D. It is not a surface anaesthetic

34. Low concentration of bupivacaine is preferred for spinal / epidural obstetric analgesia because:
    A. It has a longer duration of action
    B. It can produce sensory blockade without paralysing abdominal muscles
    C. It distributes more in maternal tissues so that less reaches the foetus
    D. All of the above are correct

35. Choose the local anaesthetic that is specifically used to produce corneal anaesthesia for tonometry:
    A. Tetracaine
    B. Oxethazaine
    C. Ropivacaine
    D. Benoxinate

36. Surface anaesthesia is used for the following except:
    A. Ocular tonometry
    B. Urethral dilatation
    C. Tooth extraction
    D. Anal fissure

37. In which of the following techniques the concentration of the local anaesthetic used is the lowest:

A. Infiltration anaesthesia
B. Nerve block anaesthesia
C. Spinal anaesthesia
D. Epidural anaesthesia

38. The following statements are true concerning adverse drug reactions (ADRs) except

A. 4th to 6th leading cause of death among hospitalized patients
B. 6.7% incidence of serious ADRs
C. ADRs contributes to 20% to 70% of all hospital admissions
D. 30% to 60% of ADRs are preventable

39. An adverse drug reaction could be classified as sub-acute if the reaction occurs

A. within 60 minutes
B. 1 to 24 hours
C. > 2 days
D. All of the above

40. An adverse drug reaction could be classified as moderate if the reaction is _____

A. bothersome but requires no change in therapy
B. disabling or life-threatening
C. requires change in therapy, additional treatment, hospitalization
D. None of the above

41. Propranolol and heart block, anticholinergic and dry mouth are good examples of___

A. Type A ADRs
B. Type B ADRs
C. Type C ADRs
D. Type D ADRs

42. The following is a characteristic of Type D ADRs

A. Extension of pharmacologic effect
B. Mediated through receptors
C. delayed effects
D. idiosyncratic or immunologic reactions

43. Chloramphenicol causing aplastic anemia is a good example of_____

A. Type A ADRs
B. Type B ADRs
C. Type C ADRs
D. Type D ADRs

44. The following is a characteristic of Type A ADRs
   A. rare and unpredictable
   B. Mediated through receptors
   C. delayed effects
   D. idiosyncratic or immunologic reactions

45. Which of the following is a good example of Type I allergic reaction?
   A. methyldopa and hemolytic anemia
   B. anaphylaxis with penicillins
   C. contact dermatitis
   D. procainamide-induced lupus

46. Type IV allergic reaction is mediated through_____-
   A. IgE
   B. IgG
   C. IgM
   D. None of the above

47. Which of the following is a risk factor for ADRs?
   A. Adolescent
   B. Monotherapy
   C. Multiple co-morbid conditions
   D. All of the above

48. During management of ADRs, the offending agent can be discontinued if_____
   A. there is no reasonable alternative
   B. the problem is mild and will resolve with time
   C. continuing the medication will further exacerbate the patient's condition
   D. all of the above

49. In drug discovery and development process, the following is a good example of serendipity
   A. development of the anti-influenza drug, oseltamivir
   B. penicillin discovery
   C. development of exenatide
   D. Morphine from *Papaver somniferum*

50. Which of the following drug was developed by crystallographic studies and computational methods?
   A. captopril
   B. aliskiren
   C. Morphine
   D. exenatide

SECTION B. Short answers, answer all questions

1. Briefly describe the term bioavailability (2marks)
2. In drug distribution, the passage of drugs into the brain is largely regulated by the blood brain barrier. Briefly describe the nature of the blood brain barrier and the how it regulates the passage of drugs into the central nervous system (5 marks)
3. What is the effect of plasma protein binding on drug distribution? List any four plasma proteins that bind to drugs in systemic circulation. (5 marks)
4. Give the general classification of receptors as drug targets stating examples where applicable. (5 marks)

SECTION C: answer all questions

1. Define an adverse drug reaction (2marks)
2. Outline the 10 core components of clinical trials (10 marks)
3. Write briefly on phases of clinical trial, where appropriate state the number of participants and purpose of particular phase of clinical trial (20 marks)