UNIVERSITY OF JAFFNA, SRI LANKA

SECOND EXAMINATION FOR MEDICAL DEGREES PART (I)

September 2023

2018/2019

Microbiology -Paper I

Date: 26.09.2023 **1.30 pm to 3.00 pm. (1½ hours)**

Answer all 30 questions

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1. The virulence factors that help bacteria adhere to the host tissues include
   a) capsule
   b) biofilm
   c) pili
   d) flagella
   e) endotoxin

2. Vector-borne diseases include
   a) typhus
   b) Lyme disease
   c) leptospirosis
   d) herpes labialis
   e) dengue fever

3. Normal flora of the throat include
   a) Viridans streptococci
   b) *Staphylococcus epidermidis*
   c) *Mycoplasma pneumoniae*
   d) *Legionella pneumophila*
   e) *Neisseria* spp.

4. State whether the following are true/false regarding the underlying mechanism of diarrhea by each bacteria.
   a) *Clostridium perfringens* - preformed toxin
   b) Enterohaemorrhagic *Escherichia coli* - destruction of microvilli of the small intestine
   c) *Campylobacter jejuni* - invasion
   d) *Shigella dysenteriae* - cytotoxin production in the small intestine
   e) *Vibrio cholerae* - invasion

5. Sterile gloves are indicated in healthcare settings while
   a) performing lumbar puncture
   b) assisting vaginal delivery
   c) inserting central venous line
   d) performing vaginal examination in a gynaecology patient
   e) drawing blood from the patient

6. State whether the following are true or false regarding the bacteria and the antibiotic to which it is resistant.
   a) *Streptococcus pyogenes* – penicillin
   b) *Enterococcus faecalis* – ceftriaxone
   c) *Neisseria gonorrhoeae* – vancomycin
   d) *Pseudomonas aeruginosa* – ceftriaxone
   e) *Bacteroides fragilis* – gentamicin

7. Antibiotics that can be used for the treatment of infections with *Streptococcus pneumoniae* include
   a) ceftriaxone
   b) clarithromycin
   c) co-amoxiclav
   d) gentamicin
   e) vancomycin

8. Flucloxacillin is used in the treatment of infections with
   a) *Clostridium difficile*
   b) *Bacteroides fragilis*
   c) *Acinetobacter* spp.
   d) Methicillin resistant *Staphylococcus aureus* (MRSA)
   e) *Campylobacter jejuni*

9. Innate immune
   a) response begins 5 -7 days after exposure to an infection
   b) system recognizes microorganisms through antigen presenting cells
   c) response is specific for each microorganism encountered
   d) system consists of B cells and T cells
   e) system does not produce memory cells

10. State whether the following are true or false regarding the immune response against viral infections.
    a) Interferons are the first line response against viral infections.
    b) Natural killer cells destroy virus infected cells.
    c) Dissemination of viruses throughout the body is limited by granuloma formation.
    d) Neutrophils play a major role in overcoming viral infections.
    e) Cytotoxic T cells kill virus infected cells.

11. Roles of antibodies in immune response include
    a) neutralizing toxins produced by bacteria
    b) opsonization
    c) activating complement system
    d) acting as B cell receptors
    e) activating macrophages

12. Examples of passive immunization/immunity include
    a) DTP vaccine given to children against diphtheria, tetanus and pertussis
    b) human rabies immunoglobulin given after a major exposure to rabies virus
    c) babies being born with maternal antibodies received through the placenta
    d) tetanus toxoid being given for patients with tetanus prone wounds
    e) babies receiving antibodies in the breast milk

13. Terbinafine
    a) acts on fungal cell wall
    b) is used in the treatment of dermatophytoses
    c) is not available for oral use
    d) is used in the treatment of mucormycosis
    e) is used in the treatment of infection with *Pneumocystis jirovecii*

14. *Aspergillus* species
    a) are dimorphic fungi
    b) can cause allergic bronchopulmonary aspergillosis in immunocompetent people
    c) cause disseminated infection in immunocompromised patients
    d) isolation from sputum expectorate is a reliable test to confirm the diagnosis of aspergilloma.
    e) infection is treated with voriconazole

15. State whether the following are true or false regarding transmission of *Staphylococcus aureus* in the hospital environment.
    a) It can be acquired through contaminated hands.
    b) Transmission should be prevented by wearing disposable gloves while distributing oral medication to the patients.
    c) Contaminated inanimate objects such as patient locker tops are a possible source of this infection.
    d) Regular cleaning and disinfection of the patient environment reduces the transmission.
    e) It can be acquired from the beddings of the patiems.

16. *Listeria monocytogenes*
    a) is an obligate intracellular organism
    b) can be acquired from animal source
    c) cannot be cultured in routine clinical microbiology laboratories
    d) causes neonatal infections
    e) infection is best treated with ceftriaxone

17. *Bacteroides fragilis*
    a) is an aerobe
    b) is the predominant organism in the human gut
    c) is a capsulated organism
    d) cannot be cultured in microbiology laboratories
    e) is best treated with penicillin

18. Infections caused by enterotoxigenic *E. coli* (ETEC) include
    a) cystitis
    b) pneumonia
    c) travelers' diarrhoea
    d) acute gastroenteritis
    e) neonatal meningitis

19. Rubella
    a) virus has four antigenic types
    b) is transmitted by airborne transmission
    c) has an incubation period of 2 - 3 days
    d) in adults can present with generalised maculopapular rash with arthritis
    e) can be confirmed by viral isolation from throat swab

20. Polio virus
    a) is transmitted only by symptomatic people
    b) is transmitted by faecal oral transmission
    c) has one antigenic type
    d) stool culture is done only in the reference laboratory in Sri Lanka
    e) vaccination given through the National Immunization Programme in Sri Lanka includes both live attenuated and inactivated vaccines

21. State whether the following are true or false regarding genital herpes.
    a) HSV1 is more commonly associated with genital herpes than HSV2.
    b) Genital herpes is always symptomatic.
    c) It presents as single painless ulcer.
    d) Acyclovir reduces recurrence of genital herpes.
    e) Risk of transmission of HSV to the baby is low if it is recurrent genital herpes in a pregnant mother.

22. Hepatitis C virus
    a) is transmitted by faecal-oral transmission
    b) infection is confirmed by the detection of anti-HBc IgM in the blood
    c) infection commonly leads to chronic infection in exposed people
    d) infection in pregnancy can lead to fulminant hepatitis
    e) infection can be prevented by vaccination

23. Risk groups for Human immunodeficiency virus (HIV) infection include
    a) IV drug users
    b) elderly
    c) men having sex with men
    d) babies born to women with HIV
    e) COPD patients

24. Acute bronchitis
    a) is commonly caused by viruses
    b) can occur in otherwise healthy young adults
    c) presents with barking cough and inspiratory stridor
    d) is diagnosed after excluding features of pneumonia
    e) is treated with antiviral therapy

25. Dengue hemorrhagic fever
    a) occurs with the first infection with dengue virus
    b) can be differentiated from dengue fever at the initial stage by the presence of hemorrhagic manifestations
    c) critical phase characteristically occurs a week after the onset of fever
    d) is characterized by leakage of plasma into specific body cavities
    e) patients in convalescent phase can have generalised itchy rash

26. A 47-year-old fisherman presented with a history of cough, loss of weight and loss of appetite of three weeks duration. He did not have any other significant history. Signs of consolidation were found over the apex of the right lung. State whether the following are true or false regarding this infection.
    a) Three consecutive sputum specimens should be collected from this patient for the aetiological diagnosis.
    b) Sputum direct smear microscopy for acid fast bacilli is the first investigation done for the aetiological diagnosis.
    c) Blood culture is a useful investigation in this patient.
    d) Sputum can be collected in a clean container for the first bacterial investigation done in this patient.
    e) GeneXpert test is done if resistant organism is suspected in this patient.

27. A 35-year-old man presented with purulent urethral discharge and dysuria. He did not have urinary frequency or urgency. He was sexually promiscuous. State whether the following are true or false regarding the infection in this patient.
    a) *Neisseria gonorrhoeae* is a common causative organism of this infection.
    b) *Treponema pallidum* can be responsible for the clinical features this patient has got.
    c) Routine urine culture of mid-stream urine specimen can identify the causative agent of this infection.
    d) Gram staining of urethral discharge is useful in the diagnosis of this infection in this patient.
    e) Azithromycin has no place in the treatment of this patient.

28. State whether the following are true or false regarding sepsis.
    a) Sepsis is a life threatening organ dysfunction due to infections.
    b) Skin and soft tissue infections can be complicated with sepsis.
    c) *Klebsiella pneumoniae* is one of the common bacteria responsible for sepsis.
    d) *Streptococcus pneumoniae* does not cause sepsis as it does not have endotoxin.
    e) Antibiotic treatment should be delayed till the microbiology report is received.

29. A 70-year-old lady presented to the OPD with a history of sudden onset of fever with chills, severe muscle aches and dry cough for three days. Her school going grandson also had similar symptoms. Her temperature was 39°C and her respiratory examination was unremarkable. There were no other significant findings. Influenza was suspected in this patient. State whether the following are true or false regarding this infection.
    a) She could have acquired influenza virus through droplet transmission from her grandson.
    b) Influenza has an incubation period of 1 – 4 days.
    c) RT-PCR can be used to confirm the diagnosis of influenza.
    d) Oseltamivir can be given to reduce the severity and duration of the illness in this patient.
    e) There are no vaccines to prevent influenza in this patient.

30. A four-year-old child was admitted with a history of blood and mucous diarrhoea for two days. He passed small volume stools around 15 times per day. He had lower abdominal pain and tenesmus. State whether the following are true or false regarding the infection in this child.
    a) The most possible diagnosis is bacillary dysentery.
    b) The causative organism is *Vibrio cholerae*.
    c) Stool culture is not necessary in this patient.
    d) Empirical antibiotic can be given for this infection.
    e) This infection could have been prevented by vaccination.