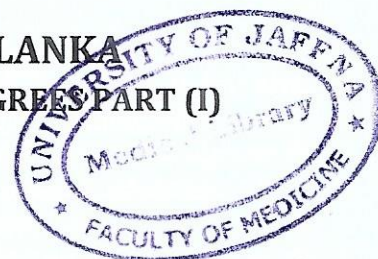




UNIVERSITY OF JAFFNA, SRI LANKA  
SECOND EXAMINATION FOR MEDICAL DEGREES PART (I)

July 2024  
Academic Year 2019/2020  
Microbiology - Paper I



Date: 02.07.2024  
Answer all 30 questions

1.30 pm to 3.00 pm. (1½ hours)

1. In healthcare settings, hand hygiene
  - a) should be performed when moving from a contaminated body site to a clean body site of the same patient
  - b) should be performed after coming into contact with wounds
  - c) is not necessary if gloves are worn correctly
  - d) should be performed before touching patients
  - e) should be performed after touching a patient's immediate surroundings
2. Contact transmission-based precautions are necessary for infections with
  - a) measles virus
  - b) carbapenem resistant Enterobacteriaceae
  - c) ESBL producing *Klebsiella pneumoniae*
  - d) *Mycoplasma pneumoniae*
  - e) Rota virus
3. T- cell independent immune response
  - a) recognizes the antigens presented on MHC II molecules
  - b) occurs in infections with capsulated bacteria
  - c) produces mainly IgG immunoglobulin
  - d) involves B cells
  - e) does not produce memory cells
4. Antibody mediated immune response
  - a) is a nonspecific immune response
  - b) occurs within a day after the primary exposure to a microorganism
  - c) plays a major role in combating typhoid fever
  - d) provides mucosal immunity through IgA antibodies
  - e) helps to overcome infections with capsulated bacteria
5. Type I hypersensitivity
  - a) is a delayed hypersensitivity reaction
  - b) is the underlying reason for anaphylaxis
  - c) response is the result of the release of vasoactive substances from mast cells
  - d) is associated with high levels of IgG
  - e) is the underlying reason for acute rheumatic fever

6. Tetanus toxoid
  - a) is a live attenuated vaccine
  - b) should be given to road traffic accident patients with incomplete immunity against tetanus
  - c) is contraindicated in patients with tetanus
  - d) is given through the national immunization programme in Sri Lanka
  - e) is given to pregnant mothers to prevent neonatal tetanus
  
7. Gentamicin
  - a) has good oral bioavailability
  - b) gives good cover against anaerobic bacteria
  - c) can be used in the treatment of infections with methicillin resistant *Staphylococcus aureus* (MRSA)
  - d) can be used in the treatment of typhoid fever
  - e) is excreted poorly in the urine
  
8. Penicillin G can be used in the treatment of
  - a) erysipelas
  - b) enterococcal infections
  - c) Group B streptococcal infections
  - d) melioidosis
  - e) infections with *Pseudomonas aeruginosa*
  
9. Antibiotics used in the treatment of *Mycoplasma pneumoniae* infections include
  - a) co-amoxiclav
  - b) clarithromycin
  - c) ceftriaxone
  - d) vancomycin
  - e) imipenem
  
10. Factors contributing to the emergence and/or spread of antimicrobial resistance include
  - a) inadequate infection prevention and control measures in the healthcare system
  - b) prescribing antibiotics for all suspected infections
  - c) availability of over the counter antibiotics
  - d) lack of facilities for the diagnosis of aetiological agents and their sensitivity patterns
  - e) strict adherence to antibiotic guidelines/policies
  
11. Candida
  - a) is a normal flora of the oral cavity
  - b) cannot be cultured in routine microbiology laboratories
  - c) can cause endocarditis in IV drug users
  - d) oesophagitis occurs in bottle fed babies
  - e) invasive infections can be treated with nystatin



12. *Aspergillus fumigatus*

- a) is a dimorphic fungus
- b) invasive infection occurs by inhalation of spores
- c) can cause allergic bronchopulmonary aspergillosis in immunocompetent people
- d) invasive infection is best confirmed by culturing the organism from the blood
- e) infection can be treated with voriconazole

13. Caspofungin

- a) acts on the fungal cell membrane
- b) has good oral bioavailability
- c) penetrates well into the CSF
- d) is used in the empirical treatment of neutropenic patients with sepsis
- e) is used in the treatment of invasive candidiasis

14. Methicillin Resistant *Staphylococcus aureus* (MRSA)

- a) can be transmitted by the hands of healthcare workers in the hospital setting
- b) can be sensitive to flucloxacillin
- c) screening can be done from throat swabs
- d) cannot be cultured in the routine microbiology laboratories
- e) infections can be treated with meropenem

15. Stool culture report of an eight-year-old child revealed growth of *Campylobacter jejuni*. Common ways by which this child could have acquired this infection include

- a) person to person transmission while playing with another infected child
- b) eating undercooked poultry
- c) drinking unpasteurized milk
- d) aerosol transmission
- e) drinking contaminated water

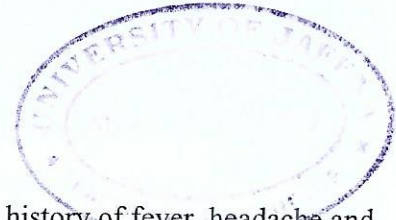
16. A ten-month-old child with poor immunization history was brought to the hospital with intractable cough for two days. Cough was ending with an inspiratory "whoop". The illness started with runny nose. His chest radiograph was normal. Pertussis was suspected in this child. Pertussis

- a) is transmitted by airborne transmission
- b) is not transmitted during the catarrhal stage
- c) causative organism invades patient's blood
- d) causative organism cannot be cultured in routine microbiology laboratories
- e) is best treated with penicillin

17. Human papillomavirus (HPV)

- a) can be transmitted by direct skin to skin contact
- b) can be acquired from people shedding the virus asymptotically
- c) is not transmitted by non-penetrative sex
- d) transmission needs to have sexual contact with several people
- e) can be transmitted from mother to baby during birth

18. A medical student noticed that she develops painful vesicles at the border of her lips around the time of each exams. She remembered having painful ulcers in the mouth when she was ten years old. State whether the following are true or false regarding the infection in this patient.
- Herpes zoster is the most possible diagnosis.
  - Herpes simplex virus (HSV) is the most possible causative organism.
  - The illness she had at ten years can be gingivostomatitis.
  - Repeated exposure to the causative organism is the reason for her recurrent symptoms.
  - This infection could have been prevented by vaccination.
19. State whether the following are true or false regarding antiviral treatment of influenza.
- Antiviral treatment is not necessary for most patients with influenza.
  - Acyclovir is used in the treatment.
  - Antiviral should be given within 48 hours of first symptom for the best effect, when indicated.
  - Hospitalization and mortality can be reduced by antiviral treatment.
  - Antiviral is given for influenza in late pregnancy.
20. Vaccine-derived poliovirus
- 2 (VDPV2) is still present in a few countries
  - originates from inactivated polio vaccine (IPV)
  - occurs in areas with high polio vaccination rates
  - is an important cause of gastroenteritis in children in developing countries
  - does not cause poliomyelitis
21. Dengue
- virus is transmitted by *Aedes aegypti* mosquito
  - hemorrhagic fever (DHF) occurs more following primary infection than subsequent infections with dengue virus
  - hemorrhagic fever's (DHF) pathophysiological hallmark is plasma leakage
  - hemorrhagic fever (DHF) can be differentiated from dengue fever (DF) by the presence of haemorrhagic manifestations such as petechiae and gum bleeding
  - is prevented by vaccine
22. A 47-year-old farmer was admitted with fever, chills, malaise, headache and generalized body aches for five days. On examination, he was febrile and had bilateral conjunctival suffusion. He developed jaundice and passed dark urine from the second day of admission. His full blood count revealed neutrophil leukocytosis with low platelets. Blood culture done in the routine microbiology laboratory was negative though he did not receive any antibiotic treatment prior to the admission. Serological test by MAT on paired sera taken from him confirmed the aetiology retrospectively. State whether the following are true/false regarding the infection in this patient.
- Most possible diagnosis is leptospirosis.
  - This infection is best diagnosed by dark field microscopy.
  - This patient can develop acute renal failure.
  - Blood specimen for culture should be collected five days after the onset of illness.
  - This patient is best treated with meropenem.



23. A 24-year-old otherwise healthy university student was admitted with a history of fever, headache and drowsiness of one day duration. His temperature was 40°C and blood pressure 90/60mmHg. He had neck stiffness and non blanching purpuric rash most prominent on the trunk and legs. The
- most possible causative agent is *Neisseria meningitidis*
  - causative agent of this infection is transmitted by droplet transmission.
  - causative agent can be cultured in routine microbiology laboratories
  - close contacts of this patient should be given antibiotic prophylaxis
  - infection could have been prevented in this patient by conjugate vaccine
24. A 36-year old man was admitted with sudden onset of high fever, chills, malaise and productive cough with purulent sputum for three days. He also had dyspnoea from the previous day. He had a past history of splenectomy after an accident and did not follow any medical advice given for that. His respiratory rate was 32/minute. Air entry was reduced over the right mid-anterior and right mid-lateral lung fields and was dull on percussion. Auscultation revealed coarse crepitations in the area of the right mid-anterior and right mid-lateral lung fields. State whether the following are true/false regarding the infection in this patient.
- Most possible diagnosis is community acquired pneumonia.
  - Most possible causative agent is *Mycoplasma pneumoniae*.
  - Blood culture is not useful for the aetiological diagnosis in this patient.
  - This patient should be started on empirical co-amoxiclav and clarithromycin.
  - Pneumococcal vaccine should have been given to this patient.
25. A 45-year-old woman presented with fever, headache and body aches for seven days. She rears goats and chicken for a living. On careful examination, an eschar was noted hidden in the skin folds of her left axilla. There were no other significant findings in this patient. The
- most possible diagnosis is spotted fever
  - infection in this patient is transmitted by tick bite
  - causative organism of the infection in this patient survives in rodents
  - causative organism of the infection in this patient can be cultured in routine clinical microbiology laboratories.
  - disease can lead to hearing impairment if the treatment is delayed
26. State whether the following are true or false regarding viruses and their associated malignancies.
- Human T-cell Leukemia virus 1 - Nasopharyngeal carcinoma
  - Human papillomavirus - Penile cancer
  - Herpes simplex virus I - Kaposi sarcoma
  - Epstein Barr virus - Cervical cancer
  - Hepatitis E virus - Hepatocellular carcinoma
27. Viruses that can be isolated directly from skin lesions for the purpose of diagnosis include
- Herpes simplex virus
  - Coxsackie A
  - Parvovirus B19
  - Rubella virus
  - Dengue virus

28. Hantavirus

- a) causes an emerging infection in Sri Lanka
- b) is transmitted through an arthropod vector bite
- c) can be acquired from infected monkeys
- d) can cause haemorrhagic fever with renal syndrome
- e) infection is prevented by vaccination

29. Prion diseases

- a) have a long incubation period
- b) can be transmitted by close contact
- c) are best diagnosed by PCR of the brain biopsy
- d) result in spongiform pathological changes in the brain
- e) do not induce a host immune response

30. Impetigo

- a) is an infection of dermis of the skin
- b) mainly affects children
- c) is commonly caused by *Staphylococcus aureus*
- d) is diagnosed aetiologically by blood culture
- e) transmission can be reduced by maintaining good hand hygiene