Tanta University
Faculty of Medicine
Internal Medicine Department
26/2/2022
Total: 90 marks

Applied Pathology Exam
MD degree of Internal Medicine-Feb 2022
NO. of questions: 9 questions (30 subquestions)
Time allowed: 3 hours
NO. of pages: 8

Question 1: Choose the single best answer (30 subquestions). All questions MUST be answered (45 marks, 1.5 marks for each subquestion)

1) **The single most important way to prevent non alcoholic fatty liver disease (NAFLD) is:**

   A. Weight loss

   B. Low fat diet

   C. Smoking cessation

   D. Vegeterian diet

2) **All of the following statements regarding alcoholic liver disease are true EXCEPT:**

   A. Fatty liver is present in >90% of daily and binge drinkers.

   B. Hepatitis C infection worsens the prognosis of alcoholic liver disease.

   C. Over 50% of alcoholics will develop alcoholic hepatitis.

   D. Quantity and duration of alcohol consumption are the most important risk factors for the development of alcoholic liver disease.

3) **A 60-year-old man with alcoholic liver disease was admitted with an upper GI bleed secondary to oesophageal varices. The patient undergoes endoscopic variceal banding and is discharged after 2 weeks in-hospital stay. Which of the following medications would act as prophylaxis in preventing a rebleed from his oesophageal varices?**

   A. Frusemide

   B. Ramipril

   C. Propranolol

   D. Irbesartan

4) **All of the following are B cell disorder immunodeficiency states EXCEPT:**

   A. Wiskott-Aldrich syndrome

   B. Di George's syndrome

   C. X-linked agammaglobulinaemia

   D. Selective IgA deficiency

5) **HLA association for SLE is:**

A. DR2

B. DR4

C. DR1

D. DR3

6) **Which of the following immunoglobulins has the longest half-time?**

A. IgA

B. IgE

C. IgM

D. IgG

7) **In septic shock, which marker of severe sepsis binds to endotoxin from gram-negative bacteria?**

A. Extravascular lung water

B. Procalcitonin

C. Endotoxin activity assay

D. Polysaccharide binding protein

8) **Which step of apoptosis does the bcl gene inhibit?**

A. Activation of bax by P53

B. Activation of pro-caspases

C. Polymerisation of bax molecules

D. Oligomerisation of death receptors

9) **The fragmentation of DNA into nucleosomal units is caused by which of the following?**

A. Caspase activated DNase (CAD)

B. Caspace 3

C. Apoptosis Inhibitory Proteins (AIPs)

D. Caspace 7

10) **Which of the following is NOT an initiator caspase?**

A. Caspace 8

B. Caspace 10

C. Caspace 3

D. Caspace 2

11) Regarding the innate immune system and the epithelial barrier in the GI tract, which of the following statements is FALSE?

A. Lectins found in secretions bind sugars on pathogens and activate the lectin pathway of complement activation

B. Mucus itself is a protective barrier that traps organisms and debris

C. Secretions on the epithelial barrier concentrate complement in such a way that the concentration of complement in secretions is higher than the concentration in plasma

D. Monocytes are present in secretions and in most tissues, where they phagocytose unwanted microbes

12) Which of the following statements regarding complement is FALSE?

A. Immune complexes can lodge in blood vessel walls and activate complement to produce synovitis, vasculitis, dermatitis, and glomerulonephritis

B. Almost all inherited complement deficiencies are inherited as autosomal dominant traits

C. A deficiency of complement regulatory proteins usually causes excessive activation

D. Deficiencies of early components (e.g., C1q) predispose to SLE, whereas deficiencies of C3, MBL, or MAC components lead to recurrent bacterial infections

13) Which of the following immunologic responses is prevented by the use of anti–Rh-positive antibodies (RhoGAM)?

A. Primary immune response to antigen

B. Secondary immune response (anamnestic or booster response)

C. Somatic hypermutation

D. Class switch recombination

14) Which of the following constitutes the best immunologic causative mechanism of rheumatic fever?

A. Pathogenic autoantibodies directed against the endocardium of heart

B. Direct bacterial infection of the heart

C. Antistreptococcal antibodies cross-reacting with myocardial antigens

D. Toxins released by group A Streptococcus that cause valvular damage

15) Which of the following statements regarding the pathogenesis of RA is false?

A. Damage to bone and cartilage by synovial tissue and pannus is mediated by several families of enzymes, including serine proteases and cathepsins.

B. IgG rheumatoid factor is most commonly detected in patients with RA

C. Interaction of rheumatoid factors with normal IgG activates complement and thereby starts a chain of events that includes production of anaphylatoxins and chemotactic factors

D. Although many cytokines are involved in the pathogenesis of RA, tumor necrosis factor–α (TNF-α) and interleukin-1 (IL-1) are major pathogenic factors.

16) An 18-year-old woman comes to your clinic complaining of a rash on her legs. She reports having crampy abdominal pain and aching joints for several days. She also reports that the rash began yesterday evening and was worse this morning, and she complains that her skin is itchy. Her medical history is significant only for an upper respiratory infection 2 or 3 weeks ago that resolved spontaneously. She is otherwise healthy. Physical examination is notable only for trace edema and purpura, noted on both lower extremities. You suspect small vessel vasculitis. You perform a skin biopsy, which stains positively for IgA-containing immune complexes. This biopsy finding is most consistent with which of the following diseases?

A. Henoch-Schönlein purpura

B. Urticarial vasculitis

C. Churg-Straus syndrome

D. Wagner's granulomatosus

17) A 25-year old female has had her first deep vein thrombosis (DVT) when she started taking the oral contraceptive pill. She reveals that her mother has also had DVT before. Which of the following is she likely to have?

A. Factor V leiden

B. Protein C deficiency

C. Protein S deficiency

D. Antithrombin III deficiency

18) Which of the following foods is likely to interfere with the anticoagulant effect of warfarin when ingested in high quantities?

A. Grape juice

B. Cranberry juice

C. Broccoli

D. Lemons

19) A 30-year-old man has had fever for the past 4 days. One day before presentation, he developed difficulty speaking. Examination is remarkable for petechial hemorrhages on his lower limbs, and a temperature of 37.9°C. Lab.: Hb.: 8.1 g/dL, Hct 23.9%, MCV 99 fL, platelet count 8000/mm3, WBC count 10100/mm3, prothrombin time: 16 seconds, partial thromboplastin time: 44 seconds, creatinine: 2.2 mg/dL, haptoglobin: 2 mg/dL, and total bilirubin 4.9mg/dL. Examination of his peripheral blood smear shows schistocytes. He died despite plasmapheresis. At autopsy, platelet thrombi are observed in the small arteries of the kidneys, heart, and brain. Which of the following is the most likely diagnosis?

A. Thrombotic thrombocytopenic purpura (TTP)

B. vonWillebrand disease (vWD)

C. Hemolytic uremic syndrome

D. Systemic lupus erythematosus (SLE)

20) Regarding the anticoagulant role of antithrombin all are true EXCEPT :

A. Relies on endogenous heparin to increase its activity 1000-fold.

B. Predominantly inhibits FVIIa and FIXa, in addition to thrombin.

C. It has a reactive center and a heparin-binding site.

D. Its deficiency has 2 types .

21) A 69-year-old female known to have type 2 diabetes. Her HbA1c was 9%. The physician decides to try meglitinides . Which best describes the mode of action of meglitinides ?

A. Reduces insulin resistance and improves insulin sensitivity

B. Suppresses basal hepatic glucose production

C. Reduces fasting plasma glucose

D. Stimulates first-phase insulin secretion in the pancreatic beta cells

22) Regarding sodium-glucose transporter 2 inhibitors (SGLT2i), which of the following is TRUE?

A. They inhibit SGLT2 in the distal convoluted tubules to prevent reabsorption of glucose and facilitate its excretion in urine.

B. Their efficacy is reduced in patients with renal impairment.

C. Their mechanism of action is independent on blood glucose levels

D. There is high potential for hypoglycemia.

23) Which of the following statements regarding the metabolic syndrome is TRUE?

A. An accumulation of visceral rather than subcutaneous fat has been observed in individuals with the metabolic syndrome

B. First-line therapy for treatment of the metabolic syndrome is highdose statin therapy

C. The lipid abnormalities associated with the metabolic syndrome are a very high total low-density lipoprotein (LDL) cholesterol level and normal HDL cholesterol and triglyceride levels

D. Patients with metabolic syndrome are NOT at increased risk for cardiovascular morbidity and mortality

24) All of the following statements regarding the use of exogenous erythropoietin in patients with chronic kidney disease are true EXCEPT:

A. Exogenous erythropoietin should be administered aiming at a target hemoglobin concentration of 10–11.5 g/dL.

B. Use of exogenous erythropoietin is associated with improved cardiovascular outcomes.

C. Use of exogenous erythropoietin is associated with increased risk of stroke in patients with concomitant type 2 diabetes mellitus.

D. Use of exogenous erythropoietin may be associated with faster progression to the need for dialysis.

25) Regarding the role of fibroblast groth factor-23 (FGF23) in pathogenesis of chronic kidney disease–mineral and bone disorder (CKD-MBD), which of the following is FALSE?

A. α-Klotho is an obligate co-receptor for FGF23

B. FGF23 increases renal phosphate reabsorption by increasing Na-dependent co-transporters

C. FGF 23 suppresses circulating 1,25 $(OH)_2$ vitamin D.

D. FGF receptors (FGFR) 1, 3 and 4 are targets for FGF23 in the kidney,

26) Generally, the peak rise in RBCs in response to erythropoeitin stimulating agents (ESAs) occurs at:

A. 8 to 12 weeks.

B. 1 to 3 weeks

C. 3 to 6 weeks

D. 3 to 6 months

27) In management of anemia in patients with end stage kidney disease (ESKD), which of the following is TRUE?

A. A target Hb.% of 13 gm/dl is usually recommended in most patients.

B. Erythropoeitin level should be regularly during treatment

C. Oral iron is usually effective in treating iron deficiency

D. The use of angiotensin receptor blockers may be associated with ESAs hyporesponsiveness

28) Regarding pure red cell aplasia induced by Erythropoiesis-Stimulating Agents (ESAs), which of the following is TRUE?

A. It may be caused by antibodies directed against erythropoietin

B. Usually associated with reticulocytosis

C. White cell and platelet count are normal

D. Clinically suspected in patients with severe ESAs resistance

29) Which might be suggestive of renal failure, hypoparathyroidism, and pseudohypoparathyroidism as a cause of hyperphosphatemia?

A. Relatively low levels of intact parathyroid hormone (PTH)

B. High serum calcium and phosphate levels

C. Low levels of PTH and vitamin D

D. Low serum calcium levels with high phosphate levels

30) **Hepcidin plays a central role in development of CKD-related anemia, which of the following statements is FALSE?**

A. Increased hepcidin level is associated with functional iron deficiency

B. Hepcidin is highly protien bound and not easily filtered through the glomeruli of the healthy kidney

C. It acts by binding to ferroportin

D. Production is increased with systemic inflammatory conditions

Short essay questions (8). All questions MUST be answered (45 marks)

Question 2: Metabolic (dysfunction) associated fatty liver disease "MAFLD"; mention FOUR medications used in treatment of MAFLD and mechanism of action of each one **(8 marks).**

Question 3: Liver cirrhosis; mention FOUR cytokines involved in development of liver cirrhosis. Illustrate the role of each one in pathogenesis of liver cirrhosis **(8 marks).**

Question 4: Mention pathophysiological mechanisms involved in development of anemia in patients with chronic kidney disease **(5 marks).**

Question 5: Enumerate FOUR causes of physiological apoptosis **(4 marks).**

Question 6: Enumerate FOUR classes of antihyperlipidemic drugs. Mention an example and mechanism of action for each class **(6 marks).**

Question 7: Mention FIVE causes of acquired thrombophilia **(5 marks)**

Question 8: Enumerate FOUR effects of insulin resistance on lipid metabolism **(4 marks)**

Question 9: Enumerate FIVE sites involved in pathogenesis of type 2 diabetes and mention one drug working on each site **(5 marks).**

GOOD LUCK