Biochemistry

1) Among the following sets of proteins, one set is playing a role in cellular membranes transportof iron?

a. Hepcidin, and matriptese2.
b. Ceruloplamin and heme carrier protein.
c. DMT1 and transferrin.
d. Duodenal cytochrome B and iron regulatory proteins.
e. Ferritin and ferroportin.

Ans :b

2) The main plasma protein that affect osmotic pressure of plasma is?

a. Gamma Globulins.
b. Albumin.
c. Prothrombin.
d. Fibrinogen.
e. Alpha Globulins.

Ans : b

3) Protein electrophoresis is showing dense Alpha2 globulin band when there is increase in the concentration of the following plasma proteins?

a. Transcortin and haptoglobin.
b. Ceruloplasmin and Alpha 2 macroglobulin.
c. a fetoprotein, thyroid binding protein.
d. Polyclonal antibodies and transcortin.
e. C-reactive protein and B lipoprotein.

Ans : b

4) The asymmetric substitution of the tetrapyrrole ring of heme starts with the activity of thefollowing enzyme?

a. ALA synthase.
b. PBG synthase.
c. Uroporphyrinogen synthase Ill.
d. Coproporphyrinogen oxidase.
e. Coproporphyrinogen decarboxylase.

Ans : c

5) A 4 years old boy came to the hospital suffering from burning sensation in the exposed areasof the skin to sun light, his blood analysis reveals the presence of porphyrin in the erythrocytes, which one of the following genes is suspected to have a

mutation responsible for this disease?

a. Coproporphyrinogen oxidase.
b. Uroporphyrinogen decarboxylase.
c. Ferrochelatase.
d. ALA synthase.
e. Uroporphyrinogen synthase lll.

Ans : E

6) The defensive function of plasma protein is due to?

a. Albumin.
b. Globulins.
c. Fibrinogen.
d. Prothrombin.
e. Both Albumin & Fibrinogen.

Ans : b

7) Intravascular hemolysis of erythrocytes is associated initially with increased the rate of expression of the gene encoding for this protein?

a. Transferrin. b. Hemosiderin. c. Ferritin.
d. Haptoglobin. e. Methemoglobin.

Ans: d

8) A 48 years old man came to the liver clinic in a hospital. after the examination. clinically he was diagnosed of having jaundice due to hepatocellular failure, all of the following investigations for such a case are correct EXCEPT?

a. No increase in reticulocytes %.
b. Both types of bilirubin are elevated.
c. All liver enzymes are elevated.
d. Urine urobilinogen is reduced.
e. Vitamin K cannot prolonged PT.

Ans :d

9) Glucose 6 phosphate dehydrogenase is the key regulatory enzyme in pentose phosphate pathway. responsible for reducing glutathione, what is wrong about the disease caused by thedeficiency of this enzyme?

a. Uncontrolled diabetes mellitus is one of the causes of the hemolytic crises.
b. May be associated with acute renal failure.
c. It is an X-linked disorder but females may show its manifestations.
d. All variants encoding for the enzyme result in clinical consequences.
e. The best way for the proper diagnosis of the disease is by genetic analysis.

Ans : d

10) Which of the following statements is true regarding the metabolic pathways in RBCs?

a. All variants of glucose 6-phosphate dehydrogenase are accompanied by clinical consequences.
b. The mutation 721G —» T of pyruvate kinase is a missense mutation.

c. Phosphoglucose isomerase deficiency is not affecting reduced glutathione regeneration.
d. Phosphoglycerate kinase deficiency shows 2, 3 bisphosphoglycerate accumulation.
e. Triacylglycerols synthesis in RBCs is not affected by triose phosphate isomerase deficiency.

Ans : d

11) Von Willebrand disease is one of the commonest blood coagulation disorders, it could be duegenetic or acquired causes, what is correct about the disease?

a. All mutations causing vWF disease are affecting quantitively the gene product.
b. The mutations affecting vWF gene are associated with reduction of Vlla factor.
c. There are some subtypes of one of the types of vWF disease.
d. The mutations affecting the gene encoding for vWF are not variable.
e. Medications are not inducing vWF disease.

Ans : c

12) The mutations in o and [3 globin genes are variable causing different types of hemoglobinopathies, among them one is due to a mutation leading to unstable mRNA'?

a. Unstable hemoglobin disorder.
b. Hemoglobin M variant.
c. Hereditary persistence of Hb F.
d. Hemoglobin Lepore.
e. Hemoglobin Constant Spring.

Ans: e

14) Which of the following enzymes in heme synthetic pathway is requiring a cosynthase moleculefor the asymmetric substitution of heme tetrapyrrole ring?

a. ALA synthase.
b. Uroporphyrinogen synthase III.
C. PBG deaminase.
d. Protoporphyrinogen oxidase.
e. Uroporphyrinogen decarboxylase.

Ans : b

1) Crigler-Najjar syndrome, type I is a genetic disorder causes of unconjugatedhyperbilirubinemia. what is wrong about it?

a. The level of unconjugated bilirubin exceeds 20 mg/dl.
b. Mostly, it causes kernicterus.
c. The only effective treatment before brain damage is by liver transplantation.
d. It is due to a mutation in the coding region of UDP glucuronosyltransferase gene.
e. Heme oxygenase inhibitors can be used to reduce heme production.

Ans: a

2) A eight years old girl with abdominal pain and motor neuropathy, she was diagnosed of having congenital erythropoietic porphyria, which catabolite of the following can be

detected inher urine?

a. ALA. b. PEG. c. 7- carboxylate porphyrin.
d. Uroporphyrinogen I. e. Protoporphyrin.

Ans : d

3) Disseminated intravascular coagulation is a blood coagulation disorder that results in suddenwidespread of fibrin thrombi in the microcirculation affecting the vital organs, choose the wrongone?

a. It is secondary to other illnesses.
b. Associated with the release of thromboblastic substances from the involved organs.
c. Endotoxins and cytokines are apparent.
d. Protein C is inhibited.
e. Thrombomodulin expression is not suppressed on the endothelium.

Ans: e

4) What condition leads to a deficiency in factor IX that can be corrected by an intravenousinjection of vitamin K?

a. Classic hemophilia.
b. Hepatitis B.
c. Bile duct obstruction.
d. Genetic deficiency in Anti-thrombin III.
e. Hemophilia C.

Ans: c

5) Hb inside RBCs performs the following functions EXCEPT?

a. Allows RBCs to pass in narrow capillaries.
b. O2 carriage.
c. CO2 carriage.
d. Acid — base buffer.
e. Combines with Glucose to form glycosylated Hb.

Ans : a

6) The deficiency of pyruvate kinase is one of the causes of RBCs hemolysis, but some of its manifestations can be hidden due to?

a. Increase production of 2. 3 bisphosphoglycerate.
b. Decrease production of 1, 3 diphosphoglycerate.
c. Increase activity of Na/K ATPase.
d. Increase activity of glucose 6-phosphate dehydrogenase.
e. Increase ATP production.

Ans : a

7) Which of the following would best explain a prolonged bleeding time test?

a. Hemophiliac A.

b. Hemophilia B.
c. Thrombocytopenia.
d. Coumarin use.
e. Hemophilia C

Ans: c

8) The genetic defects in the membrane of erythrocytes are among the causes of hemolytic anemia. all of the following investigations for RBCs hemolysis are correct EXCEPT?

a. CBC reveals high reticulocytes count.
b. Liver enzymes are normal.
c. Blood lactate dehydrogenase level is normal.
d. Hemoglobinuria is detected.
e. Urobilinogen and stercobilinogen are normal.

Ans: e

9) A 12-year-old male patient has suffered from a long history of bleeding for hours or days after the injury as well as recurrent painful haemarthroses. Which of the following are the correct laboratory test findings that consistent with this case?

a. Prolonged PT, PTT and BT.
b. Prolonged PTT and PT with normal BT.
c. Specific assay for factor IX or factor VIII above than 100 U/dl.
d. Prolonged BT. normal PT and PTT and platelet less than 100.000/mm3
e. Prolonged PTT and normal PT and BT

Ans: e

10) In glycolytic pathway. pyruvate is normally released from inside erythrocytes because of?

a. The low activity of glyceraldehyde 3-phosphate dehydrogenase.
b. The high activity of pyruvate kinase.
c. The maintenance of hemoglobin iron in the reduced form.
d. The absence of metHb reductase enzyme.
e. The high concentration of 2,3-bisphosphoglycerate.

Ans : c

11) Plasma levels of the following proteins can be used as biomarkers for diagnosis of multiple myeloma?

a. Beta2-microglobulin. paraprotein and a—fetoprotein.
b. alpha2— macroglobulin, Bence Jone's proteins and Beta2-microglobulin.
c. Bence Jone's proteins, cryoglobulins and paraprotein.
d. Beta2-microglobulin, alpha-fetoprotein and alpha2- macroglobulin.
e. alpha1-antitrypsin. paraprotein and C-reactive protein.

Ans: c

12) When erythrocytes are hemolyzed intravasculary, then some of the heme molecules areoxized. the rate of expression of the following protein is increased to scavenge iron?

a. Haptoglobln. b. Transferrin.
c. Ferritin. d. Hemopexin.
e. Methemalbumin.

Ans: e

13) Which one of the following sets of enzymes in heme synthetic pathway can be inhibited by lead?

a. ALA synthase and ALA dehydratase.
b. PBG synthase and PEG deaminase.
c. Uroporphyrinogen synthase Ill and ALA synthase.
d. Uroporphyrinogen decarboxylase and Coproporphyrinogen oxidase.
e. Ferrochelatase and ALA dehydratase.

Ans : e

14) Severe Beta-thalassemia may not become clinically apparent until a child is several months old because?

a. Overexpression of ζ -globin compensates for the missing beta-chain.
b. Elevated hemoglobin A2 compensates for the missing beta- globin genes.
c. The alpha-globin genes don't turn on until several months after birth.
d. They γ to beta—globin switch is not complete until several months after birth.
e. The oxygen needs of a newbom are minimal.

Ans: d

15) in heme synthetic pathway, one of the following sets of enzymes is starting and finalizing the asymmetrical substitutions of the four pyrrole rings of heme molecule?

Select one:

a. Coproporphyrinogen oxidase and protoporphyrinogen oxidase.
b. Porphobilinogendeaminase and uroporphyrinogen decarboxylase.
c. Porphobilinogen synthase and protoporphyrinogen Oxidase.
d. ALA synthase and hydroxymelliylbllane synthase.
e. Uroporphyrinogen synthase Ill and coproporphyrinogen oxidase.

Ans : e

16) Which one of the following is true regarding jaundice due to acute viral hepatitis?

a. alpha fetoprotein is increased.
b. AST and ALT are normal.
c. Serum albumin is decreased.

d. Conjugated bilirubin is not excreted in urine.
e. Serum conjugated bilirubin is increased.

Ans: e

17) Protein electrophoresis is showing dense at globulin band when there is increase in the concentration of the following plasma proteins?

a. Transcortin. haptoglobin and ceruloplasmin.
b. Transcortin, paraprotein and alpha 1 antitrypsin.
c. d fetoprotein. transcortin and thyroid binding protein.
d. Thyroid binding protein. polyclonal antibodies and d fetoprotein.
e. C- reactive protein, transferrin and B lipoprotein,

Ans :e

18) Intravascular degradation of heme yields unconjugated bilirubin to be transported to liver bound to albumin, one of the following is true about this?

a. It is the only site that produces unconjugated bilirubin.
b. Albumin ls a specific carrier for unconjugated bilirubin.
c. Hydrogen concentration is affecting unconjugated binding to bilirubin albumin.
d. Albumin is always having high affinity binding sites for unconjugated bilirubin.
e. Haptoglobin and hemopexin can participate in carrying unconjugated bilirubin-

Ans: c

19) Hemophilia A, the X-linked recessive blood clotting defect-permanent due to missing factor VIII, the most common mutations in the gene encoding for factor VIIIcausing the disorder are?

a. Nonsense mutations.
b. Deletions mutations.
c. Point mutations.
d. Missense mutations.
e. Frame shift mutations.

Ans: d

20) Which of the following statements is true regarding the metabolic pathways are in RBCs?

a. All variants of glucose 6-phosphate dehydrogenase are accompanied by clinical consequences.
b. The mutation 721G →T of pyruvate kinase is a missense mutation.
c. Phosphoglucose lsomerase deficiency is not affecting reduced glutathione regeneration.
d. Phosphoglycerate kinase deficiency shows 2, 3 bisphosphoglycerate accumulation.
e. Triacylglycerols synthesis in RBCs is not affected by triose phosphate isomerase deficiency.

Ans : e

21) What condition leads to a deficiency in factor IX that can be corrected by an intravenous injection of vitamin K?

a. Classic hemophilia.
b. Hepatitis B.
c. Bile duct obstruction.
d. Genetic deficiency in Anti-thrombin III.
e. Hemophilia C.

Ans :c

22) Porphyria cutanea tarda is characterized by all of the following EXCEPT?
Select one:

a. Overdoses of iron are among the risk factors.
b. It is due to the deficiency of a cytosolic enzyme.
c. An inhibitor of an enzyme can be given to relief its symptoms and signs.
d. Besides variegate porphyria, both are having neurocutaneous manifestations.
e. Can be diagnosed by investigating the presence of a modified intermediate in the stool.

Ans : d

23) Different proteins are involved in iron metabolism. among them hepcidin which is not characterized by?
Select one:

a. it is upregulated by increased iron level to down regulate ferroportin.
b. It is downregulated by decreased iron level to up regulate ferroportin.
c. Its high expression rate is regulating bacterial growth negatively.
d. its low expression rate is regulating bacterial growth positively.
e. it is directly affecting iron exportation from tissues to blood.

Ans : e

24) One of the following diseases and disorders is commonly associated with polyclonalgammopathy?

a. Rheumatoid arthritis.
b. Multiple myeloma.
c. Smoldering myeloma.
d. Monoclonal gammopathy of undetermined significance.
e. Waldenstrom macroglobulinemia.

Ans : a