

HLS-Biochemistry

Archive

Lecture 3+4

Heme degradation

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1. Which of the following causes intrahepatic jaundice?

- A) Drug-induced hepatitis
- B) Common bile duct stone
- C) Pancreatic carcinoma
- D) Choledochal cyst
- E) Gallstones

2. Which statement about heme degradation is INCORRECT?

- A) Heme oxygenase utilizes NADPH
- B) Oxygen is a reactant in the first step
- C) First step breaks methylene bridges between rings I & II
- D) First step breaks methylene bridges between rings I & IV
- E) Cytochrome P450 converts biliverdin to bilirubin

ANSWER: A

3. Children with which condition are most likely to die from kernicterus if untreated?

- A) Gilbert syndrome
- B) Crigler-Najjar syndrome, type II
- C) Crigler-Najjar syndrome, type I
- D) Dubin-Johnson syndrome
- E) Rotor syndrome

ANSWER: D

4. During heme degradation to bilirubin, which metabolic pathway provides essential agent required for this conversion?

- A) Pentose phosphate pathway
- B) Glycolysis
- C) Urea cycle
- D) Citric acid cycle

ANSWER: C

5. Intravascular hemolysis causes the liver to produce protective proteins against free hemoglobin. This can be detected by measuring:

- a. Plasma heme level
- b. Plasma hemoglobin level
- c. Plasma liver enzymes
- d. Plasma albumin

ANSWER: A

ANSWER: B

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6. An 18-year-old presents with mild jaundice (icterus), normal CBC, normal LDH, negative hepatitis tests, and elevated bilirubin. After one week, bilirubin levels decreased spontaneously without treatment. What is the most likely cause?

Transient bile obstruction by gallstones

7. Which of the following statements about bilirubin metabolism is incorrect?

- a. Urobilinogen may be produced in the liver.
- b. Unconjugated bilirubin produces urobilinogen.

ANSWER: A

8. Intravascular degradation of heme yields unconjugated bilirubin, which is transported to the liver bound to albumin. Which of the following is true about this process?

- a. It is the only site that produces unconjugated bilirubin.
- b. Albumin is a specific carrier for unconjugated bilirubin.
- c. Albumin always has high-affinity binding sites for unconjugated bilirubin.
- d. Haptoglobin and hemopexin can participate in carrying unconjugated bilirubin.

ANSWER: all are incorrect

9. 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.

ANSWER: E

10. When erythrocytes are hemolyzed intravascularly, some heme molecules are oxidized. The rate of expression of which protein is increased to scavenge iron?

- a. Haptoglobin
- b. Transferrin
- c. Ferritin
- d. Hemopexin
- e. Methemalbumin

ANSWER:

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11. 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 (LDH) level is normal.
- d. Hemoglobinuria is detected.
- e. Urobilinogen and stercobilinogen are normal.

ANSWER: C

12. A 48-year-old man came to the liver clinic in a hospital. After examination, he was clinically diagnosed with 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 prolong PT

ANSWER: E

13. 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.

ANSWER: D

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

- A. ALA synthase and ALA dehydratase.
- B. PBG synthase and PBG deaminase.
- C. Uroporphyrinogen synthase III and ALA synthase.
- D. Uroporphyrinogen decarboxylase and coproporphyrinogen oxidase.
- E. Ferrochelatase and ALA dehydratase.

Answer : E

15- Which enzyme in heme synthesis converts two of the propionyl side chains into vinyl groups?

- A. Uroporphyrinogen 3 synthase
- B. Uroporphyrinogen decarboxylase
- C. Coproporphyrinogen oxidase
- D. Protoporphyrinogen oxidase
- E. Ferrochelatase

Answer : C

16- Which of the following enzymes is responsible for the conversion of propionyl side chains into vinyl groups in heme synthesis?

Coproporphyrinogen oxidase

