Vitamin B12: Pernicious Anemia and Red Blood Cell Maturation

Nutrition · Answer Key · 29 Questions

1. What is the primary role of Vitamin B12 in the context of red blood cells?

A) Iron absorption enhancer
B) Erythrocyte maturation factor
C) Folate antagonist
D) Hemoglobin synthesis inhibitor

2. What is the traditional term for the condition caused by Vitamin B12 deficiency, which is now more accurately described as microcytic hyperchromic anemia?

A) Macrocytic anemia
B) Pernicious anemia
C) Sideroblastic anemia
D) Aplastic anemia

3. Where are cobalamins (Vitamin B12) absorbed in the small intestine?

A) Duodenum
B) Jejunum
C) Ileum
D) Cecum

4. What is required for the absorption of cobalamins in the ileum?

A) Intrinsic factor
B) Parietal cells
C) Gastric acid
D) Pepsin

5. Which part of the stomach secretes intrinsic factor?

A) Antrum
B) Pylorus
C) Fundus
D) Cardia

6. Unlike most other B-vitamins, where can cobalamins be stored in significant amounts?

A) Kidneys
B) Muscles
C) Liver
D) Brain

7. Which of the following is NOT a manifestation of pernicious anemia?

A) Anorexia
B) Vomiting
C) Jaundice
D) Excessive appetite

8. What is the characteristic red blood cell defect in pernicious anemia?

A) Microcytic hypochromic anemia
B) Normocytic normochromic anemia
C) Macrocytic hyperchromic anemia
D) Spherocytosis

9. The term "pernicious" in pernicious anemia historically meant:

A) Curable
B) Incurable
C) Common
D) Rare

10. Which of these tissues has one of the highest concentrations of Vitamin B12?

A) Skin
B) Hair
C) Bone marrow
D) Lungs

11. Bacterial synthesis of cobalamin occurs, but it is not significant in:

A) Cows
B) Chickens
C) Humans
D) Rats

12. What is the most active and common form of cobalamin circulating in the blood?

A) Cyanocobalamin
B) Methylcobalamin
C) Adenylcobamide
D) Hydroxocobalamin

13. What is the Philippine Recommended Nutrient Intake (RNI) for Vitamin B12 per day for males and females 10 years and over?

A) 1.4 mcg/day
B) 2.0 mcg/day
C) 2.4 mcg/day
D) 3.0 mcg/day

14. How much additional Vitamin B12 is recommended per day for pregnancy according to the Philippine RNI?

A) 0.1 mcg/day
B) 0.2 mcg/day
C) 0.3 mcg/day
D) 0.4 mcg/day

15. What is the US-RDA for Vitamin B12 for adults per day?

A) 2.0 mcg/day
B) 2.4 mcg/day
C) 3.0 mcg/day
D) 4.0 mcg/day

16. In general, which type of food sources contain significant amounts of Vitamin B12?

A) Plant sources
B) Animal proteins
C) Fungi
D) Algae

17. Strict vegans have been observed to have deficiencies of Vitamin B12 because:

A) They do not consume enough calories
B) Plant sources have practically zero B12
C) Their gut bacteria produce insufficient B12
D) They have a higher metabolic rate

18. What is a symptom of nerve degeneration, especially of the spinal cord, in advanced cases of Vitamin B12 deficiency?

A) Increased reflexes
B) Numbness and tingling sensations (paresthesias)
C) Improved coordination
D) Enhanced vibratory sense

19. The discovery of Vitamin B12 as a specific therapeutic vitamin for pernicious anemia was considered a milestone in:

A) Surgery
B) Pediatrics
C) Clinical nutrition
D) Dermatology

20. What is the characteristic appearance of red blood cells in macrocytic hyperchromic anemia?

A) Smaller than normal with less pigment
B) Normal size and pigment
C) Larger than normal with higher pigment
D) Irregular shape with no pigment

21. Vitamin B12 is essential for the normal functioning of which of the following?

A) Skin, hair, and nails
B) Liver, kidneys, and spleen
C) Nerves, bone marrow, and brain
D) Lungs, stomach, and intestines

22. What is the term used to describe the increased size of red blood cells in pernicious anemia?

A) Microcytic
B) Normocytic
C) Macrocytic
D) Anisocytic

23. What is the term used to describe the higher level of pigment in red blood cells in pernicious anemia?

A) Hypochromic
B) Normochromic
C) Hyperchromic
D) Poikilocytic

24. The text mentions that Vitamin B12 cannot replace which other vitamin in treatment?

A) Vitamin C
B) Vitamin D
C) Folic acid
D) Niacin

25. What does the text state about antagonists of Vitamin B12?

A) They are common
B) They have been observed
C) No antagonist has been observed
D) They are primarily found in plant-based diets

26. Yellowish skin is one of the manifestations of:

A) Iron deficiency anemia
B) Pernicious anemia
C) Folate deficiency anemia
D) Vitamin C deficiency

27. Loss of vibratory sense is a symptom associated with:

A) Vitamin A deficiency
B) Vitamin B12 deficiency
C) Vitamin K deficiency
D) Vitamin E deficiency

28. What is the role of Vitamin B12 in preventing pernicious anemia?

A) It directly increases iron absorption
B) It is essential for erythrocyte maturation
C) It acts as an antioxidant
D) It stimulates bone growth

29. In terms of red blood cell production, Vitamin B12 is considered an:

A) Erythrocyte destruction factor
B) Erythrocyte production inhibitor
C) Erythrocyte maturation factor
D) Erythrocyte size regulator