Eating Disorders: Questions and Case studies

Questions

1. **A girl, who is 17 years old and 170 cm tall with a weight of 45 kg. Her average daily intake of energy nutrients is 100 g of carbohydrates, 20 g of protein and 15 g of fat.** 1. What is her daily energy intake (in kcal, kJ) ? 2. What is her basal metabolic rate? Use a rough estimate ie BMR = 24 x weight in kg.
2. **Kwashiorkor manifests itself as:**
   - A – By slowing growth
   - B – Loss of subcutaneous fat
   - C – Hypoalbuminemia
   - D – edema
3. **Which vitamins are absorbed directly into the intestine?**
   - A – Folic acid
   - B – biotin
   - C – Vit. B_{12}
   - D – Vit. E
   - E – Pantothenic acid

Answers

Question 1.

- 1. The girl consumes 100 × 4 = 400 kcal saccharides, 20 × 4 = 80 kcal protein a 15 × 9 = 135 kcal fat, wholly 615 kcal/den, which is 615 × 4,18 kJ = 2 570,7 kJ.
- 2. 24 × 45 = 2 880 kcal/d = 2 880 × 4,18 kJ = 12 038,4 kJ

Question 2.

- A – Correct
- B – Incorrect − subcutaneous fat is preserved unlike in marasmus
- C – Correct
- D – Correct

Question 3.

- A – Correct
- B – Correct
- C – Incorrect - B12 must first bind to "intrinsic factor"
- D – Incorrect - vitamin E is absorbed together with fats in micellar form
- E – Correct

Case reports

A woman, aged 73 years old

She had been living in a nursing home for 2 years, and in recent months she had difficulty walking, had paresthesias and numbness in her legs. A neurologist diagnosed peripheral neuropathy. He suspected inadequate nutrition, especially in terms of vitamin intake. He had the concentration of transketolase in erythrocytes examined.

Questions:

1. **What causes transketolase deficiency?**
2. **What are the symptoms of thiamine pyrophosphate deficiency?**

Answers

1. It is a lack of vitamin B1 (thiamine diphosphate), which is a cofactor of enzymes in the conversion of pyruvate and 2-oxoglutarate to acetyl-CoA (pyruvate dehydrogenase) or succinyl-CoA (2-oxoglutarate dehydrogenase) and further in the pentose cycle, where it is a coenzyme of transketolase (catalyzes the transfer of a 2-carbon unit from xylulose-5-phosphate to ribose-5-phosphate to form sedoheptulose-7-phosphate).
2. The organism contains only thirty times the daily requirement. Chronic malnutrition (or unilateral nutrition or increased need as in chronic alcohol abuse) results in peripheral neuropathy, muscle weakness, dementia and heart failure. It can also be Wernicke's encephalopathy (memory loss, nystagmus) or beriberi. By filing B1, the situation improves very quickly. One of the laboratory tests is a comparison of glucose utilization before and after application of thiamin diphosphate. The most sensitive method is the determination of the

catalytic concentration of transketolase in the hemolysate. An increase of 20% after B1 application is a sign of deficiency.

A man, aged 68 years old

He was on parenteral nutrition for established malnutrition. He was diagnosed with pernicious anemia. The attending physician ordered a blood sample to be taken to determine the B12 level.

Questions:

1. Was this examination necessary for the patient? (Note: This is a relatively expensive examination.)

Answers

1. It wasn't. In this case, it is enough to monitor the blood count and thus monitor vitamin B12 supplementation. However, it is necessary to examine the stomach in more detail for the possible occurrence of cancer, which is very suspicious in atrophic gastritis accompanied by pernicious anemia, especially in the elderly who are losing weight.

Sources

- MASOPUST, Jaroslav a Richard PRŮŠA. *Patobiochemie metabolických drah.* 1. vydání. Praha : Univerzita Karlova, 1999. 182 s. s. 208- 210. ISBN 80-238-4589-6.