

4 YEAR OLD BOY WITH GENERALIZED OEDEMA

This case study aims to

- Help understand the various clinical presentations of childhood protein energy malnutrition
- Differentiate between marasmus and kwashiorkor
- Discuss the management of a child with kwashiorkor

Case

Hari is a 4 year old boy. His mother has brought to the primary health centre. He says that the boy appears 'swollen' and that he is highly irritable.

The boy has a half a 'pav' and half a glass of milk for breakfast, his lunch consists 1 small chapatti. In the night he eats half a vati of rice.



On examination, the positive findings are

- *Weight 11kg*
- *Reddish colour hair*
- *Generalized oedema*
- *Moon facies*
- *Abdominal distension*
- *Hepatomegaly.*
- *Skin- dark, dry, with crazy pavement dermatosis*

Systemic examination is normal

1. Based on the above history and examination, the diagnosis is

- a) Marasmus
- b) Kwashiorkor**
- c) Marasmic kwashiorkor
- d) None of the above

Marasmus vs. kwashiorkor

- Protein-energy malnutrition (PEM) applies to a group of related disorders that include marasmus, kwashiorkor, and intermediate states of marasmus-kwashiorkor.
- The term marasmus means withering or wasting. Marasmus involves inadequate intake of protein and calories and is characterized by emaciation
- The term kwashiorkor means "the sickness of the weaning." and it refers to an inadequate protein intake with reasonable caloric (energy) intake
- Edema is characteristic of kwashiorkor but is absent in marasmus
- marasmus represents an adaptive response to starvation, whereas kwashiorkor represents a maladaptive response to starvation

- Children may present with a mixed picture of marasmus and kwashiorkor, and children may present with milder forms of malnutrition. Jelliffe suggested the term protein-calorie (energy) malnutrition to include both entities

2. What are the causes of protein energy malnutrition?

- The most common cause of malnutrition is inadequate food intake. Preschool-aged children in developing countries are often at risk for malnutrition because of their dependence on others for food, increased protein and energy requirements, immature immune systems causing a greater susceptibility to infection, and exposure to nonhygienic conditions
- Ineffective weaning secondary to ignorance, poor hygiene, economic factors, and cultural factors.
- Gastrointestinal infections precipitate clinical protein-energy malnutrition because of associated diarrhea, anorexia, vomiting, increased metabolic needs, and decreased intestinal absorption. Parasitic infections play a major role in many parts of the world.
- Chronic diseases, such as cystic fibrosis, chronic renal failure, childhood malignancies, congenital heart disease, and neuromuscular diseases, contribute to malnutrition.
- Fad diets, inappropriate management of food allergies, and psychiatric diseases, such as anorexia nervosa, can also lead to severe protein-energy malnutrition.

3. What are the clinical features of kwashiorkor?

- The symptoms vary from lethargy, apathy, irritability to inadequate growth, loss of muscular mass, secondary immunodeficiency and edema
- Renal function is decreased; the liver and the heart may enlarge
- Dermatitis is common; the hair is sparse, thin and dyspigmented
- Infections, vomiting and diarrhea are common.
- There are signs of vitamin and mineral deficiencies; delayed bone growth
- Mental changes may occur, followed by stupor, coma and death

4. How would you investigate this child?

- Detailed dietary history, growth measurements, body mass index (BMI), and a complete physical examination are indicated.
- Sensitive measures of nutritional deficiency in children include height-for-age or weight-for-height measurements less than 95% and 90% of expected, respectively, or greater than 2 standard deviations below the mean for age
- WHO recommends the following laboratory tests:
 - Blood glucose
 - Examination of blood smears by microscopy or direct detection testing
 - Hemoglobin
 - Urine examination and culture
 - Stool examination by microscopy for ova and parasites
 - Serum albumin
 - HIV test
 - Electrolytes

Lab findings in kwashiorkor include

- low albumin concentration

- low plasma glucose
- ketonuria
- low plasma amino acids
- decreased K⁺, Mg⁺⁺
- low cholesterol

5. How would you treat this child?

- Correction of fluid and electrolyte abnormalities- The most common electrolyte abnormalities are hypokalemia, hypocalcemia, hypophosphatemia, and hypomagnesemia.
- Treatment of infections
- Macronutrients by dietary therapy - Milk-based formulas are the treatment of choice. At the beginning of dietary treatment, patients should be as the child wants. After 1 week, intake rates should approach 175 kcal/kg and 4 g/kg of protein for children. A daily multivitamin should also be added.

References

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