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Kwashiorkor

Kwashiorkor is also known as protein malnutrition, protein–energy (calorie) malnutrition and malignant malnutrition.

What is kwashiorkor?

Kwashiorkor is a form of protein–energy malnutrition caused by the inadequate intake of protein with reasonable caloric (energy) intake. The other form of protein–energy malnutrition is the condition known as marasmus. Marasmus involves inadequate intake of both protein and calories. Hence, protein–calorie malnutrition encompasses a group of related disorders that include kwashiorkor, marasmus, and intermediate or mixed states of kwashiorkor and marasmus.

What are the signs and symptoms of kwashiorkor?

Early signs of kwashiorkor present as general symptoms of malnutrition and include fatigue, irritability and lethargy. As protein deprivation continues the following abnormalities become apparent.

- Failure to thrive (failure to put on height and weight)
- Loss of muscle mass
- Generalised swelling (oedema)
- Large protuberant belly (pot belly)
- Fatty liver
- Failing immune system so prone to infections and increased severity of normally mild infections
- Skin and hair changes

Cutaneous features of kwashiorkor

Characteristic skin and hair changes occur in kwashiorkor and develop over a few days.

- Skin lesions are at first erythematous before turning purple and reddish–brown in colour with marked exfoliation (skin peeling and sloughing)
- Where the skin becomes dark and dry, it splits open when stretched to reveal pale areas between the cracks (“lacquered flaky paint”, “crazy pavement dermatosis”)
- Irregular or patchy discolouration of the skin caused by pigmentary changes
- Hair becomes dry and lustreless and may turn reddish yellow to white in colour. It becomes sparse and brittle and can be pulled out easily.
- Nail plates are thin and soft and may be fissured or ridged.

What causes kwashiorkor?

Kwashiorkor is the commonest and most widespread nutritional disorders in developing countries. It occurs in areas of famine or areas of limited food supply, and particularly in those countries where the diet consists mainly of corn, rice and beans.

It is more common in children than in adults. The onset in infancy is during the weaning or post–weaning period where protein intake has not been sufficiently replaced.

How is the diagnosis made?

Physical examination may show an enlarged liver and generalised swelling (oedema). Laboratory tests usually show the following significant findings in kwashiorkor.

- Low blood sugar levels
- Low blood protein levels
- High levels of cortisol and growth hormone
- Low levels of salts in the blood, especially potassium and magnesium
- Reduced levels of the waste product urea in urine
- Iron deficiency anaemia
- Metabolic acidosis (low pH of blood)
- Reduced hydroxyproline in the urine, reflecting poor growth and defective wound healing

Other tests include, detailed dietary history, growth measurements, body mass index (BMI) and complete physical examination. [Skin biopsy](#) and hair-pull analysis may also be performed.

What is the treatment for kwashiorkor?

Treatment should start with correcting fluid and electrolyte imbalances. Any infections should also be treated appropriately. Once the patient is stabilised, usually within 48 hours, small amounts of food should be introduced. Food must be reintroduced slowly, carbohydrates first to provide energy, followed by protein foods. Vitamin and mineral supplements may also be given. The reintroduction of food may take over a week by which time the intake rates should approach 175kcal/kg and 4g/kg of protein for children and 60kcal/kg and 2g/kg of protein for adults.

The outlook for patients with kwashiorkor is dependent on the stage of the disease at the time it is first treated.

- Treatment given early in the course of the disease generally produces a good recovery, although growth potential will never be achieved in children who have had kwashiorkor.
- Treatment in the later stages of the disease generally improves the patient's health but physical and intellectual disabilities are usually irreversible.
- The disease can be fatal if it is not treated or when treatment is given too late in the course of the condition.

Related information

References:

- Book: Textbook of Dermatology. Ed Rook A, Wilkinson DS, Ebling FJB, Champion RH, Burton JL. Fourth edition. Blackwell Scientific Publications.

On DermNet NZ:

Other websites:

- [Protein-Energy Malnutrition](#) – emedicine dermatology, the online textbook
- [Kwashiorkor](#) – Medline Plus

Books about skin diseases:

See the [DermNet NZ bookstore](#)

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DermNet does not provide an on-line consultation service.

If you have any concerns with your skin or its treatment, see a [dermatologist](#) for advice.

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