

MALNUTRITION OF PROTEINS

1. KWASHIORKOR

➤ Introduction

- Kwashiorkor, also known as “edematous malnutrition” because of its association with edema (fluid retention)
- It is a nutritional disorder most often seen in regions experiencing famine.
- It is a form of malnutrition caused by a lack of protein in the diet. People who have kwashiorkor typically have an extremely emaciated appearance in all body parts except their ankles, feet, and belly, which swell with fluid.



- Kwashiorkor is rarely found in the United States and other countries with a generally steady food supply. It's most common in sub-Saharan Africa and other countries where people routinely have a limited supply of food.
- Most people who are affected by kwashiorkor recover fully if they are treated early.
- Treatment involves introducing extra calories and protein into the diet. Children who develop kwashiorkor may not grow or develop properly and may remain stunted for the rest of their lives.
- There can be serious complications when treatment is delayed, including coma, shock, and permanent mental and physical disabilities.
- Kwashiorkor can be life-threatening if it's left untreated. It can cause major organ failure and eventually death.

➤ What causes kwashiorkor?

- Kwashiorkor is caused by a lack of protein in the diet.
- Every cell in your body contains protein. You need protein in your diet for your body to repair cells and make new cells. A healthy human body regenerates cells in this way constantly.
- Protein is also especially important for growth during childhood and pregnancy. If the body lacks protein, growth and normal body functions will begin to shut down, and kwashiorkor may develop.
- Kwashiorkor is most common in countries where there is a limited supply or lack of food. It is mostly found in children and infants in sub-Saharan Africa, Southeast Asia, and Central America Trusted Source. A limited supply or lack of food is common in these countries during times of famine caused by natural disasters — such as droughts or floods — or political unrest.
- A lack of nutritional knowledge and regional dependence on low-protein diets, such the maize-based diets of many South American countries, can also cause people to develop this condition.
- This condition is rare in countries where most people have access to enough food and are able to eat adequate amounts of protein.
- If kwashiorkor does occur in the United States, it can be a sign of abuse, neglect, or fad diets, and it's found mostly in children or older adults.
- It can also be a sign of an underlying condition, such as HIV.

➤ **What are the symptoms of kwashiorkor?**

The symptoms of kwashiorkor include:

- Change in skin and hair color (to a rust color) and texture
- Fatigue
- Diarrhea
- Loss of muscle mass
- Failure to grow or gain weight
- Edema (swelling) of the ankles, feet, and belly
- Damaged immune system, which can lead to more frequent and severe infections
- Irritability
- Flaky rash
- Shock

➤ **How is kwashiorkor diagnosed?**

- If kwashiorkor is suspected, your doctor will first examine you to check for an enlarged liver (hepatomegaly) and swelling. Next, blood and urine tests may be ordered to measure the level of protein and sugar in your blood.
- Other tests may be performed on your blood and urine to measure signs of malnutrition and lack of protein. These tests may look for muscle breakdown and assess kidney function, overall health, and growth. These tests include:
 - Arterial blood gas
 - Blood urea nitrogen (bun)
 - Blood levels of creatinine
 - Blood levels of potassium
 - Urinalysis
 - Complete blood count (cbc)

➤ **How is kwashiorkor treated?**

- Kwashiorkor can be corrected by eating more protein and more calories overall, especially if treatment is started early.
- You may first be given more calories in the form of carbohydrates, sugars, and fats. Once these calories provide energy, you will be given foods with proteins.
- Foods must be introduced and calories should be increased slowly because you have been without proper nutrition for a long period. Your body may need to adjust to the increased intake.
- Your doctor will also recommend long-term vitamin and mineral supplementation to your diet.

➤ **What are the complications of kwashiorkor?**

- Even with treatment, children who have had kwashiorkor may never reach their full growth and height potential.
- If treatment comes too late, a child may have permanent physical and mental disabilities.
- If left untreated, the condition can lead to coma, shock, or death.

2. MARASMUS

➤ **Introduction**

- Marasmus is a form of severe malnutrition. It can occur in anyone who has severe malnutrition, but it usually occurs in children. It typically occurs in developing countries. Marasmus can be life-threatening, but you can get treatment for it.

➤ **Symptoms of marasmus**

- The main symptom of marasmus is being underweight.
- Children with this condition have lost a lot of muscle mass and subcutaneous fat. Subcutaneous fat is the layer of fat just under the skin.



- Dry skin and brittle hair are also symptoms of marasmus.
- In children with marasmus, the following can also occur:
 - Chronic diarrhea
 - Respiratory infections
 - Intellectual disability
 - Stunted growth
- Seriously malnourished children may look older and have little to no energy or enthusiasm for anything.
- Marasmus can also make children short-tempered and irritable, but this is usually a more common symptom of kwashiorkor.

➤ **Causes of marasmus**

- Nutrient deficiency is the main cause of marasmus.
- It occurs in children that don't ingest enough protein, calories, carbohydrates, and other important nutrients.
- This is usually due to poverty and a scarcity of food.
- There are several types of malnutrition.
- A malnourished child may have something other than marasmus. Among the more common types of malnutrition are serious deficiencies in:
 - iron
 - iodine
 - zinc
 - vitamin A

➤ **Risk factors for marasmus**

- Growing up in a developing country is a risk factor for marasmus.
- Areas that have famines or high rates of poverty have higher percentages of children with marasmus.
- Nursing mothers may be unable to produce enough breast milk due to malnutrition. This affects their babies.
- Viral, bacterial, and parasitic infections can cause children to take in too few nutrients.
- Regions with high disease rates and insufficient medical care may also have other factors that reduce the chances of people having enough food to eat.

➤ **How is marasmus diagnosed?**

- A doctor can often make a preliminary diagnosis of marasmus through a physical exam. Measurements, such as height and weight, can help determine whether a child has marasmus. When those measurements are well below the measurements that a healthy child of a particular age should have, marasmus may be the cause.
- A lack of motion in a malnourished child may also help confirm a diagnosis of marasmus.
- Children with the condition tend to lack the energy or will to do anything.
- Marasmus is difficult to diagnose using blood tests. This is because many children with marasmus also have infections that can affect blood test results.

➤ **How is marasmus treated?**

- Initial treatment of marasmus often includes dried skim milk powder mixed with boiled water. Later, the mixture can also include a vegetable oil such as sesame, casein, and sugar. Casein is milk protein. The oil increases the energy content and density of the mixture.
- Once a child starts to recover, they should have a more balanced diet that meets their nutritional needs.
- If dehydration is a problem because of diarrhoea, rehydration should also be a priority. A child may not necessarily need fluids delivered intravenously. Oral hydration may be sufficient.
- Infections are common among children with marasmus, so treatment with antibiotics or other medications is standard. Treating infections and any other health issues can help give them the best chance of recovery.

KWASHIORKOR VS MARASMUS

- In preschool children (1-5 years of age)
- Due to low protein intake
- Mild growth retardation
- Mild reduction in body weight
- Protruding abdomen and subcutaneous fat reserved
- Ribs not very prominent
- Poor appetite
- Enlarged fatty liver
- Oedema present
- Moonfacies
- Sparse hair
- Flaky paint-like skin
- Lethargic
- Requires adequate amount of protein



Kwashiorkor

- In weakened infants (<1 year old)
- Due to low calorie intake
- Severe growth retardation
- Severe reduction in body weight
- Shrunken abdomen and subcutaneous fat not preserved
- Prominent ribs
- Voracious feeder
- No fatty liver
- Oedema not present
- An old man like face
- No hair changes noted
- Dry and wrinkled skin
- Alert but irritable
- Requires adequate amount of protein, fat and carbohydrate



Marasmus

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