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COIMBATORE-641 035, TAMIL NADU



19FTO302 - FOOD NUTRITION

UNIT III - CARBOHYDRATE, PROTEIN AND FAT

TOPIC : Deficiency states of proteins, carbohydrates and fat nutrition- signs and symptoms

What is marasmus?

Marasmus is a severe form of malnutrition — specifically, protein-energy undernutrition. It results from an overall lack of calories. Marasmus is a deficiency of all macronutrients: carbohydrates, fats, and protein. People with marasmus are visibly depleted, severely underweight and emaciated. Children may be stunted in size and development. Prolonged marasmus leads to starvation.

What is the difference between marasmus and kwashiorkor?

Marasmus and kwashiorkor are two different variations of severe protein-energy undernutrition. Marasmus is a deficiency of all macronutrients, while kwashiorkor is a deficiency in protein predominantly. Kwashiorkor occurs in people who may have access to carbohydrates — bread, grains or starches — but lack protein in their diet. Marasmus has a wasted and shriveled appearance, while kwashiorkor is known for causing edema — swelling with fluid, especially in the belly and the face.

Who does marasmus affect?

Marasmus can affect anyone who lacks overall nutrition, but it particularly affects children, especially infants, who require more calories to support their growing bodies. It is more common in developing countries with widespread poverty and food scarcity, and where parasites and infectious diseases may contribute to calorie depletion. In the developed world, elderly people in nursing homes and hospitals or who live alone with few resources are more at risk.

What happens to the body in marasmus disease?

When the body is deprived of energy from food, it begins to feed on its own tissues — first adipose tissue (body fat) and then muscle. It also begins shutting down some of its functions to conserve energy. Cardiac activity slows down, causing low heart rate, low blood pressure and low body temperature. In some cases, this leads to heart failure. The immune system is also compromised, making undernourished people more prone to infection and illness and slower to recover.

Children with chronic marasmus will not have the physical resources to grow and develop as they should. They may be stunted in size or have developmental delays or intellectual disabilities. These effects can be lasting, even in children who receive treatment. Parts of the digestive system also begin to atrophy from the lack of use. This means that even when people do have food to eat, they might not be able to absorb nutrition from their food effectively. Ironically, marasmus can lead to food aversion.

Symptoms and Causes

The main causes affecting all ages include:

- Poverty and food scarcity.
- Wasting diseases such as AIDS.
- Infections that cause chronic diarrhea.
- Anorexia.

What are the external signs of marasmus?

- Visible wasting of fat and muscle.
- Prominent skeleton.
- Head appears large for the body.
- Face may appear old and wizened.
- Dry, loose skin (skin atrophy).
- Dry, brittle hair or hair loss.
- Sunken fontanelles in infants.
- Lethargy, apathy and weakness.
- Weight loss of more than 40%.
- BMI below 16.

How is marasmus diagnosed?

Healthcare providers will begin by physically examining the person's body. Marasmus has some telltale physical features, the primary one being the visible wasting of fat and muscle. People with marasmus appear emaciated. The loss of fat and muscle under the skin may cause the skin to hang loose in folds. Beyond appearances, healthcare providers will measure the height or length of the person's body and the circumference of their upper arm.

Healthcare providers use a few different charts to measure a child's or adult's weight-to-height ratio against medical standards, depending on their age. Marasmus is defined differently on different charts, but it is always significantly below average. To use a chart more people are familiar with, marasmus would score below a 16 on the BMI (body mass index). The purpose of the scoring is mostly to confirm the diagnosis and rate how severe it is.

Management and Treatment

How is marasmus treated?

People in treatment for marasmus are at risk of refeeding syndrome, a life-threatening complication that can result when the undernourished body tries to reboot too fast. For this reason, rehabilitation happens in stages. Ideally, people with marasmus should be treated in a hospital setting, under close medical supervision. Healthcare providers who are trained to anticipate and recognize refeeding syndrome can help prevent or correct it by supplementing missing electrolytes and micronutrients.

Stage 1: Rehydration and stabilization

The first stage of treatment is focused on treating dehydration, electrolyte imbalances and micronutrient deficiencies to prepare the body for refeeding. In many cases, these can all be treated with one formula, REhydration SOLution for MALnutrition (ReSoMal), given orally or through a nasogastric tube. It's also important to keep the person warm to prevent hypothermia and to treat infections, which compromise their meager energy resources. Depending on the individual, it may take several hours to days before they are considered stable enough to begin refeeding.

Stage 2: Nutritional rehabilitation

Refeeding begins slowly with liquid formulas that carefully balance carbohydrates, proteins and fats. For inpatients, healthcare providers prefer tube feeding because it allows for gradual but continuous nutrition. Calories are introduced at about 70% of normal recommended values for the person's age. Eventually, they may increase to 140% of recommended values to meet the growth requirements of stunted children. This phase may last two to six weeks. During this time, patients gradually progress to more ordinary oral feeding with solid foods.

Stage 3: Follow-up and prevention

Since marasmus can recur, a complete treatment protocol includes education and outgoing support for the patient and/or their caregiver before they are discharged. In the developing world, this may mean breastfeeding support, safe drinking water and food preparation guidelines, immunizations and education to prevent widespread diseases. In the developed world, caregivers may need guidance on how to recognize signs of malnutrition in those they care for. The Malnutrition Universal Screening Tool (MUST) can help identify people at risk.