

PROTEIN ENERGY MALNUTRITION

PEM

ASNA MUHAMMED SALIM

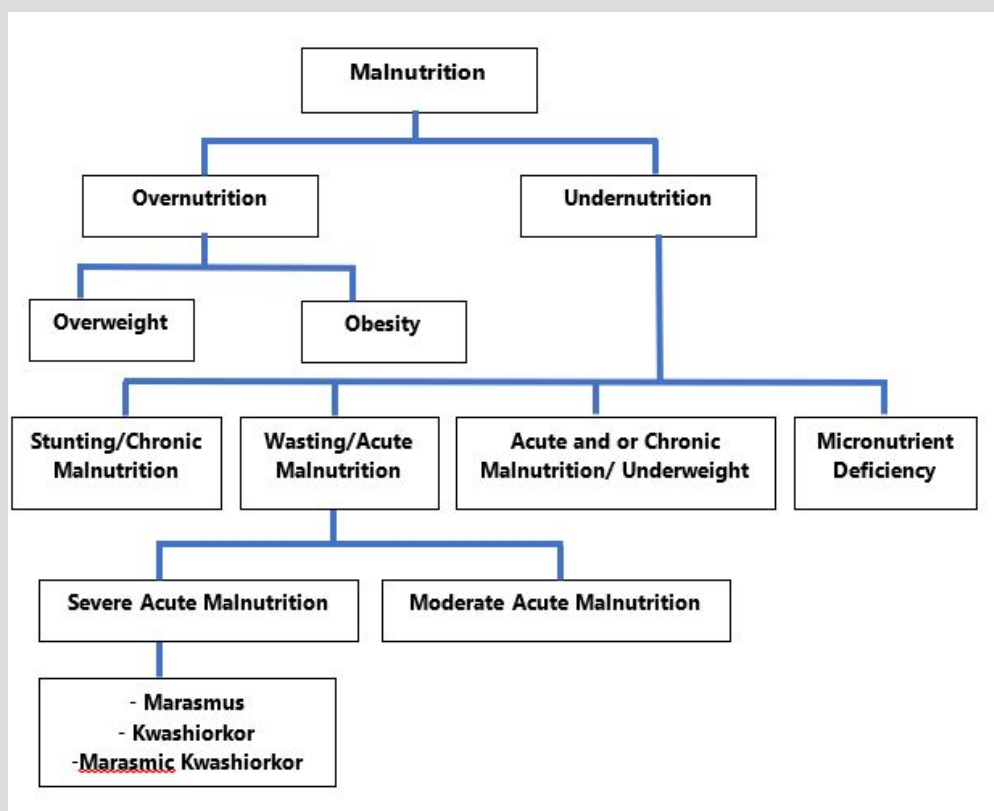
Contents

- ◆ INTRODUCTION
- ◆ CLASSIFICATION
- ◆ MARASMUS
- ◆ KWASHIORKOR
- ◆ MORPHOLOGY
- ◆ REFERENCE .

Who definition (SAM)

- ◆ The who defines severe acute malnutrition as a state characterised by a weight for height ratio that is 3 standard deviation below the normal range





SAM, previously called protein energy malnutrition(PEM) manifests as a spectrum of clinical syndromes, all resulting from a dietary intake of protein and calories that is inadequate to meet the body's needs.

Two ends of SAM are marasmus and kwashiorkor.

There are two protein compartments in the body:

- ♦ somatic compartment: represented by proteins in skeletal muscles
- ♦ visceral compartment: represented by protein stores in the visceral organs, primarily the liver.

The somatic compartment is affected more severely in marasmus, and the visceral compartment is depleted more severely in kwashiorkor

Marasmus: Marasmus develops when the diet is severely lacking in calories, seen in children less than 1 year

- ♦ A marasmic child suffers growth retardation and loss of muscle mass as a result of catabolism and depletion of the somatic protein compartment.
- ♦ The visceral protein compartment is depleted only marginally, so serum albumin levels are either normal or only slightly reduced.

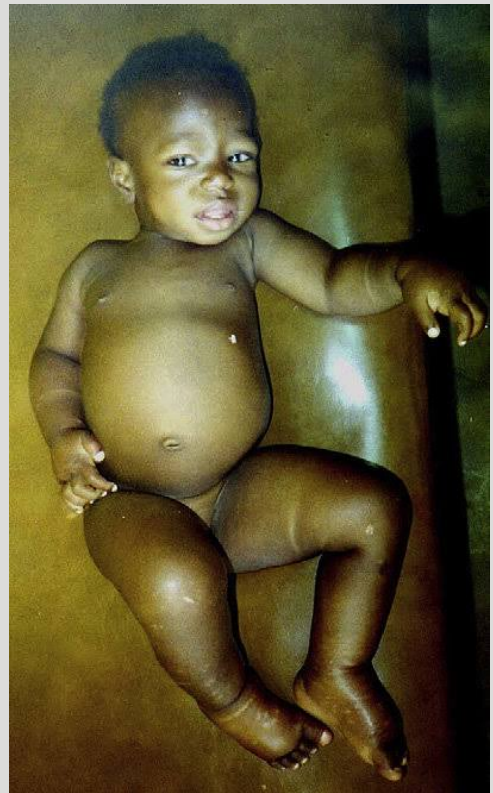


In addition to muscle proteins, subcutaneous fat is also mobilised and used as fuel. Due to losses of muscle and subcutaneous fat, the extremities are emaciated;so the head appears too large for the body.

Anemia and manifestations of multivitamin deficiencies are present, and there is evidence of immune deficiency, particularly of T-cell-mediated .hence they are prone to infection

Kwashiorkor: Kwashiorkor occurs when protein deprivation is relatively greater than the reduction in total calories .

- ♦ In kwashiorkor, unlike in marasmus, marked protein deprivation is associated with severe loss of the visceral protein compartment, and the resultant hypoalbuminemia gives rise to generalised or dependent edema



The true loss of weight is masked by the increased fluid retention. There is relative sparing of subcutaneous fat and muscle mass.

Children with kwashiorkor have characteristic skin lesions with alternating zones of hyperpigmentation, desquamation, and hypopigmentation, giving a "flaky paint" appearance.

Hair changes include loss of colour or alternating bands of pale and darker color, fine texture, and loss of firm attachment to the scalp.

MORPHOLOGY

The main anatomic changes in SAM are (1) growth failure; (2) peripheral edema in kwashiorkor and (3) loss of body fat and atrophy of muscle, more marked in marasmus.

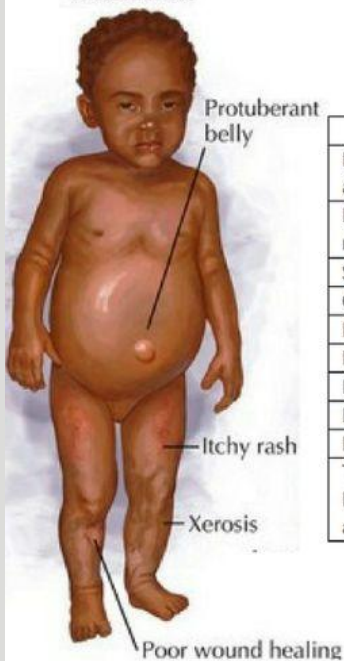
- ♦ The liver is enlarged and fatty
- ♦ The small bowel shows a decrease in mitotic cells in the crypts of the glands, associated with mucosal atrophy and loss of villi and microvilli.
- ♦ The bone marrow may be hypoplastic, mainly as a result of decreased numbers of red cell precursors
- ♦ The peripheral blood commonly reveals mild to moderate anemia; nutritional deficiencies of iron, folate, and protein.

The brain in infants who are born to malnourished mothers and who suffer SAM during the first 1 or 2 years of Life has been reported to show cerebral atrophy, a reduced number of neurons, and Impaired myelination of white matter.

- ◆ Many other changes

- (1) thymus and lymphoid atrophy (more marked in kwashiorkor than in marasmus)
- (2) anatomic alterations induced by intercurrent infections, particularly with all manner of endemic worms and other parasites.
- (3) deficiencies of other required nutrients such as iodine and vitamins.

Kwashiorkor



10 Differences between Kwashiorkor and Marasmus

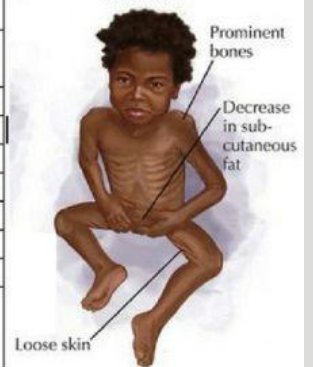
www.majordifferences.com

Comparison Table

Kwashiorkor	Marasmus
It develops in children whose diets are deficient of protein.	It is due to deficiency of proteins and calories.
It occurs in children between 6 months and 3 years of age.	It is common in infants under 1 year of age.
Subcutaneous fat is preserved.	Subcutaneous fat is not preserved.
Oedema is present.	Oedema is absent
Enlarged fatty liver.	No fatty liver.
Ribs are not very prominent.	Ribs become very prominent.
Lethargic	Alert and irritable.
Muscle wasting mild or absent.	Severe muscle wasting
Poor appetite.	Voracious feeder.
The person suffering from Kwashiorkor needs adequate amounts of proteins.	The person suffering from Marasmus needs adequate amount of protein, fats and carbohydrates.



Marasmus



Kwashiorkor vs Marasmus

Reference

- ◆ Robbins and cotran 10th edition

THANK U!!!!!!!!!!