

PREVENTION AND MANAGEMENT OF PROTEIN ENERGY MALNUTRITION

DR. G. R. MOHAN, D.H.M.S., Hyderabad

In developing countries including India there are heavy morbidity and mortality. It is particularly so in children. In India infant mortality rate is 140 per 1000 live births per year. Much more tragic is the very high mortality in pre-school children, i.e. (0-5 year). Whereas in Sweden the mortality is 0.8 per 1000 per year, the mortality in pre-school children in India is 12 per 1000 per year, and in Philippines, it is 81 per 1000 per year. Though we are comparatively well off when compared to countries like Philippines, the mortality of pre-school children in India is shockingly high. The three most common causes of deaths are malnutrition, gastroenteritis and other infections. The gastroenteritis leads to malnutrition, malnutrition worsens gastroenteritis. In gastroenteritis children are kept on sago diet, which is deficient in proteins. It is well-known that protein requirement of children are double than that of the adults, as they are growing. It is the protein deficiency which stunts the physical and mental growths of pre-school children who have fortunately escaped death due to respiratory and other infections like diphtheria, small pox, and tetanus. Infants are breast fed adequately and are protected for about 6 months from protein energy malnutrition. After six months the diminishing supply of breast milk, is grossly inadequate to supply the rapidly increasing protein requirements of growing children. Protein foods, as a rule, are costly and thereby they are beyond the reach of common men because of widespread poverty. Few amongst the rural and urban poor can afford protein-rich foods like nuts, pulses, milk, meat and eggs. Added to this are the repeated pregnancies. The breast fed infant is displaced and weaned on cereals which are poor in proteins. This leads to protein energy malnutrition. Repeated infections occur like gastroenteritis and respiratory infections leading to recurrent prolonged spells of starvation, which makes the children stunted with puffy face, pitting oedema, irritability, or apathy, discolouration of skin, scaly dermatitis, diarrhoea and liver enlargement and the children are miserable. Because powdered milk is scarce and costly, mothers dilute the milk excessively. This is another common cause of protein energy malnutrition.

To detect malnutrition periodic weight charts are essential. The circumference of chest should be more than the circumference of head by the end of first year. The mid-arm circumference lags behind the height in growth retardation. A diet rich in protein and calories is mandatory. Whole rice protein is balanced in essential amino acids though quantitatively it contains less than in wheat. When pulses are added to rice and curd the combination is excellent. The wheat is poor in lysine and methionine, whereas

maize is poor in both tryptophan and lysine. Dried peas, lentils, and Bengal gram have enough lysine but are poor in methionine, which is an essential lipotropic factor. These facts should be remembered while compiling the balanced diets adequate in all essential amino acids. It is not enough if we merely provide some sort of protein. Addition of even little milk, curd, fish or meat will enhance the net protein utilization. In poor families pregnancies should be restricted. Babies should be breast fed till the end of second year. The help of international agencies should be sought and effectively utilized in promoting the health of our children. The simplest balanced food which is adequate in essential amino acids and protein is well-cooked gruel made up of broken rice with half quantity of any cheap pulse mixed with curd.

Protein Content And Calories in 100 gram of Common Articles of Food

Food Article	Calories	Protein (gram)
Whole wheat flour	350	12.0
Rice	350	7.5
Barley	335	9.0 to 11.5
Corn flour	380	8.0
Lentils, dried	350	25.0
Peas, dried	340	25.0
Bengal gram without husk	340 to 370	20 to 25
Soya beans	330	35.0
Ground nuts	560	27.0
Milk, skimmed powder	360	38.0
Milk, cow	65	3.2
Milk, buffalo	115	4.3
Mutton	190	19.0
Eggs	180	12.8

MANAGEMENT OF DIARRHOEA

When feeding begins some patients develop diarrhoea. The lactose in milk is hydrolysed by an enzyme intestinal lactase. When the enzyme is deficient in cases of malnutrition lactose is not hydrolysed. It accumulates in the intestine and draws water into the lumen of the gut by osmosis and causes diarrhoea. Apart from this, lactose is fermented by colonic bacteria and irritant organic acids are produced. Stools become acidic to litmus, frothy and perianal area becomes inflamed. Liquid stools are passed with severe colic. In such situations milk should be avoided and soya bean milk or vegetable protein mixture is substituted. Drugs for proper assimilation of milk on constitutional basis are as follows: Calc. carb, Nat. carb, Aethusa, Antim. crud., Tuberculinum, Silicea, Lac. def. and Lac. can. etc. can be given.

High Protein Food Mixtures For Prevention of P.E.M.

	Dry weight in grams	Calories per 100 g	Proteins per 100 g
<i>Balahar</i>		390	19.0
Wheat flour	65%		
Ground nut flour	25%		
Roasted Bengal gram flour	10%		
Minerals & Vitamins			

If There Is No Milk Intolerance, The Following Diet Can Also Be Given

	Dry weight in grams	Calories per 100 g	Proteins per 100 g
<i>Corn, Soya, Milk</i>		373	20.0
Corn flour	64%		
Soya flour	24%		
Dry skimmed milk	5%		
Stabilized soya oil	5%		
Minerals and vitamins			
<i>Post-P.E.M. Feeding mixture</i>		388	21.5
Corn meal	40%		
Full fat soya flour	38%		
Dry skimmed milk	5%		
Sugar	15%		
Vanilla	2%		

Along with the above diets for good vision, blood formation and healthy bones, a preparation using cereal, pulses and greens is given below:

Rice	3½ tablespoons (50 gram)
Green gram dal (roasted)	2 tablespoons (25 gram)
Leafy vegetable (Palak or Amaranthus)	1 bundle (15 gram)
Salt	As required.

Rice and dal are cleaned, washed and cooked together. Palak is cooked and strained through a clean cloth. The vegetable juice is added to the cooked rice-dal mixture. Salt is added and mixed.

I thank Dr. P. Nagabhushanum, Principal, J.S.P.S. Govt. Homoeo. Medical College, Hyderabad, for encouraging me to write this article.

REFERENCES

1. Ghai, Om, P.: *Tropical Doctor*, Vol. 2, No. 4, (1972).
2. Folder on Nutrition & Infant Feeding, Nutrition volume No. 4, October 1976.