



The Dietary Management of a Marasmic Child from Admission unto Discharge (A Case Study of State Specialist Hospital Maiduguri, Borno State)

Yakaka Mohammed Alkali, Halima Aliyu Mudi and Ibrahim Umate

Department Of Food Science and Technology Ramat Polytechnic Maiduguri, Borno State

Abstract: *This study was carried out to monitor the progress of a marasmic child admitted into the state specialist hospital from the time of admission unto the time of discharge. The diet given and weigh gain monitored. The child was a two years old boy weighed 5.5kg upon admission and had the characteristics signed who (apathy) was placed on high-protein, high energy diet and drugs were given to treat malaria and infections. He was in the hospital for two months at the end of this period, the boy had weight gain of 13.3kg which is 65% and had become more lively. The mother was instructed on how to prepare kwash pap to the child to come back after some days. High energy dense food is complemented, is especially mathiorine and lyfine found in protein and carbohydrates both one essential amino acid. Groundnut, soyabeans palm oil and eggs are protein and some provide vitamin A to the marasmus child.*

Keywords: *Dietary, Marasmic Child, and Management*

MEANING OF MARASMUS

Marasmus is a well-defined clinical syndrome of one of the spectrum is due to a continued restriction of both calories and protein, as well as other nutrition. (Smith I.F 1987). This name came from Greek word meaning wasting and it mainly affect babies under one year old the body adapts to the shortage of food by the wasting of muscles and the depletion of fat stores so that energy is only supplied to vital organs e.g brain and heart the child therefore becomes very thin and weak and the condition often result in death (Tull 1995).

During the nineteenth century in the new industrial towns of Europe and north America, marasmus resulting from the poor diets and numerous infection took toll of infant lives probably as large it is taking in many Asian, African and south American towns today . The urban influences which predispose to marasmus are rapid succession of pregnancies and early and abrupt weaning followed by dirty and unsound artificial feeding of the infant with very dilute miik or milk products given inadequate amounts to avoid expense, thus the diet is low in both calories and protein.

In addition factory houses and homes make the preparing of clean food almost impossible (Behrens 1987). In marasmus the early weaning is in contrast to the late weaning often extending over two years which is characteristics of kwashiorkor the mother may be induced to stop breast feeding for various

reasons including the presence of infections in herself or in the infant. Unfortunately, she may have been influenced unwisely by advertisements in the press or on the radio which advocate for commercial reasons the advantages of an artificial food products the most frequent reason for stopping breastfeeding is the beginning of another pregnancy there appears to be a widespread belief among poor, uneducated women in under developed countries Nigeria that the milk of a pregnant women is bad for her child.

The incidence of P.E.M in its various forms is high in India south east Asia, most parts of Africa and middle east in the Caribbean n south and central America (BRENEMAN J.C 1990)

In the future Marasmus may become more common in underdeveloped countries as a continuing decline in .breastfeeding *and* the urbanization .of uneducated families socially insecure and linking in poor insanity houses and with insufficient money to buy adequate supplement of milk or milk substitutes.

CLINICAL FEATURES OF MARASMUS

The clinical presentation of p.e.m depends on the severity and -ration of the dietary deficiencies the clinical features of the four forms are described separately by Breneman (1990).

In p.e.m abroad clinical spectrum exists between kwashiorkor *zr* the one hand and marasmus on the other with many continuous overlapping conditions in between kwashiorkor on the one hand and maramus on the other with many continuous overlapping conditions between where features of both are found. Although considerable variability is seen distinctions usually are based upon the nature of 2 dietary deficient but protein is lacking, in marasmus both calories d protein are deficient (Williams 1987).

AIMS AND OBJECTIVES

This project is aimed at monitoring a marasmus child from the time of admission into the hospital up to the time of discharge specification aim are:-

- (i) To collect the biodata of the child
- (ii) To obtain socio economics information of the child family.
- (iii) To monitor the dietary management of the child condition from admission up to time of discharge.
- (iv) To monitor weight gain and gradual disappearance or other sign & symptoms of marasmus during the period of the Childs admission,
- (v) To offer nutritional advices
- (vi) To formulate nutritional diet to the child.

PROB LEMS OF PROTEIN ENERGY MALNUTRION (P.E.M)

Protein energy malnutrition (PEM) is the most important public wealth problem in under developed countries in the world today. It is argely responsible for the fact that in many areas up to half of the children born do not survive to the age of five years. Death rates in these children may be 20-50 times the rate in rich and prosperous communities in Europe and North America (David Son 1975). P.E.M is regarded as a spectrum of disease arising from an “adequate diet especially in childhood. There is always a deficiency defcary protein, which may be associated with varying degrees of calories deficiency. Marasmus is a well - defined clinical syndrome at crse end of the spectrum and is due to a continued restriction of both calories and protein, as well as other nutrients. At the other end is fawashiorkor, due to quantitative and qualitative deficiency of rrotein, but in which calorie intake may be adequate. These two syndromes are the extremes of protein calorie malnutrition. In between them are forms in which the clinical features are due to .=rying combination of deficiency of minerals and vitamins and with associated infection. These well - defined forms, sometimes referred as marasmic kwashiorkor and nutritional dwarfing provides the -ajority of cases of protein calorie malnutrition.

Good accounts of this condition are found in Trowel- (1954), .Viteri (1964), and Brock (1966).

CAUSES OF MARASMUS

The main cause is starvation that is a diet lacking in protein and in energy, the most common reasons for the starvation are:-

1. Failure of breast feeding, as a result of death of mother, abandonment of child, or actual failure of breast feeding (often e-ding to nutritional marasmus from inability to' afford to buy adequate milk and

lack of knowledge of how to prepare feeds of right strength, and to infective diarrhoea as a result of using dirty feeding utensils, especially an unclean bottle).

2. Starvation as a treatment sometimes nutritional marasmus may be produced by too long of a period of starvation of children with infective diarrhoea children should have their diet restricted for as short time as possible, and usually not longer than 24 hours.
3. Failure to introduce mixed diet late marasmus can occur in children receiving prolonged breast feeding alone. After six months, other foods are needed in addition to breast milk. Marasmus is often associated with diarrhoea, disease or tuberculosis (Breneman 3. C 1990) child health in the tropics and food Allergy.

CHARACTERISTIC FEATURES OF MARASMUS

Me laren (1981) gave the following characteristic features of marasmus:-

General Features

Occurrence	-	World Wide
Usual age	-	Infancy
Adaptation to stress	-	Good

Long - term Effects:-

Mental	-	Severe
Physical	-	Severe
Liver damage	-	Nil

Clinical Signs:-

Edema	-	Absent
Dermatosis	-	Rare
Hair Changes	-	Common
Hepatomegaly	-	Common
Mental Change	-	Uncommon
Wasting	-	Severe
Anaemia	-	Common and severe
Vitamin deficiencies	-	Uncommon

General laboratory findings.

Total body mass	-	High
Extra cellular water	-	Some increase

Body potassium	-	Some depletion
Malabsorption	-	Some
Fatty infiltration of liver	-	Absent
X - ray bone loss Severe	-	mild
V glucose tolerance	-	Normal
Renal function	-	Impaired
Response to adrenaline	-	Exaggerated
Serum		
Albumins	-	Slightly low
Enzymes (in general)	-	Normal
Triglycerides	-	Normal
Copper, zinc and sodium	-	Normal
Cholesterol	-	Normal
Amino acid	-	Normal
B – lipoprotein	-	High
Insulin	-	Low
Growth hormone	-	Low or Normal
Glucose	-	Low
Urine:-		
Urea/Tota! number	-	Above 65%
Imidazone acrylic acid	-	Nil
Hydroxylproline index	-	Low
Urea cycle enzyme	-	Low
Amino Acid synthesizing enzyme	-	High

Source:- Mac laren, D.S (1981) Nutrition and its Disorders 3rd Edition Baltimore William and Wilkins Co.

Symptoms Presented are:-

(a) Always present

- (i) Growth failure as shown by body weight which is extremely low for the age.
- (ii) Wasting of both muscles and subcutaneous fat, as the diet has been low in calories as well as protein. In severe cases, the face has a "Little old man" appearance.
- (b) Sometimes present
 - (i) Loose stools often because of infective diarrhoea
 - (ii) Hair changes similar to those of kwashiorkor can occur, but are much less marked very coloured light hair is very unusual.
 - (iii) Signs of associated vitamin deficiency
 - (iv) Dehydration from infection diarrhoea

Comparison with kwashiorkor. In contrast to kwashiorkor, children with nutritional marasmus:-

- (i) Often under 1 year old
- (ii) Are obviously thin and wasted
- (iii) Have very little Odema, or usually none at all
- (iv) Are not miserable
- (v) Have a good appetite

ETIOLOGY AND EPIDEMIOLOGY

PEM occurs characteristically in children under five years, wherever the diet is poor in protein and energy. No age is immuned, but is rate in older persons. .

This disease is much less frequent and . the clinical; manifestation not so obvious and usually less severe, because both protein andenergy requirement are relatively reduced as age advances.

Typically the marasmus form of the syndrome occur mostly in infants under 1 year and is more frequently in town and large cities. Month 5/12

Month 5/12	12/12
Breast feeding	Late gradual weaning
Early abrupt weaning	Starch family diet
Dilute dirty formula	
Repeated infection	Acute infection
(Gastro - enteritis)	
Starvation Therapy	
Nutritional	Marasmus Kwashiorkor

Marasmus

Kwashiorkor

8/12

18/12

Fig 1 paths leading from early weaning to nutritional marasmus and from protracted breast feeding to kwashiorkor

PREVENTION OF MARASMUS

Long - term preventive Measures This will be concerned with such wide activates as:

- (1) Improving the country's food supply, especially of animal protein foods, such as milk, fish and meat, and protein rich plant foods such as legumes, and relatively high protein.
- (2) Improving the general level of education so that parents, especially mothers, to understand the importance of the correct feeding of their children.
- (3) Improving the economic level of the country and the money available for people to buy foods.
- (4) Improving the medical facilities including maternal and child welfare services for nutrition and health supervision and treatment, for education and for the prevention of infections disease (that is by immunization). This in turn is related to the need to educate health staff in paediatrics especially nutrition.

Immediate preventive measures

For the practical worker, the immediate concern is the prevention of protein calorie malnutrition in young children under the care or supervision. Method of presentation in general, two main overlapping methods are available

- (1) Health education:- That is the teaching of ail section of community, especially fathers and mothers, to make use of available child welfare clinic facilities and to grow total protein foods in their own gardens.
- (2) Supply of special infant food. This may take the form of animal protein (i.e DSM, Fish powder meat powder) or of various cheap locally - produced high protein infants food. Method of preparation will have to be explained. It is usually best - to issue the DSM of other foods in powder form for mixing with local dishes, especially test pastes or "multi mixes" special- categories. Such as towns may have to be given particular attention (Breneman, 1990).

Ignorance and poverty are the two main causes. Education in Nutrition is necessary not only for mothers and potential mother, but for the whole community including doctors and nurses. To overcome poverty in rural areas, new methods of animal husbandry and introduction of improved varieties of seeds for the main crops are needed.

DIETARY MANAGEMENT OF MARASMUS

Appropriate local fluid mixtures for PCM During the early days of management of the malnourished child particularly the child with marasmus some time it create kwashiorkor and appetite is possible to formulate appropriate and nutritionally adequate fluid mixture using locally available food materials. Available data suggest that one crucial factor which determines the nutritional effectiveness of such a mixture is protein energy density. Research evidence shows that children with educations malnutrition (Marasmic kwashiorkor) have to achieve an energy intake of 58.3 Keal/kg/day before they

do start to lose edema fluid. Those children who fail to consume 58.64 Kcal/kg/day (the energy level considered approximately the Basal metabolic rate, BMR of a malnourished child, accumulated edema. These the energy intake at which edema to be 58.3 - 64.8 kcal/kg/day.

In addition, the energy cost of tissue maintenance was estimated to be approximately 81.6 kcal/kg/day. Also, a reduction in total body potassium was found to be closely associated with edema and edematous children have been observed to have a diuretic response to increased potassium intake. The table shown below gives the recipes for local fluid matures that can be used the early periods of management of the malnourished child or until the child can adequately consume a solid diet. Mixture A or kwashpap A provides a calculated protein and energy intake of 0.6g and 96.3kcal 100ml, or a total intake of 963kcal and 6.0g protein/liter. This diet if completely consumed supplies maintenance requirements of protein to maintain body weight in non edematous, malnourished children without permitting new tissue synthesis. It is this inadequate for normal children, the mixture is appropriate for the child with edematous malnutrition and should be fed until the edema fluid recedes and then the child is switched to mixture B or kwashpap B. this mixture provides a calculated intake of 3.1g protein and 136 kcal/100ml. it is more energy dense and supplies more protein for new tissue synthesis the malnourished child should gradually move from this mixture to a mixed diet. Kwashpap B or mixture B is also appropriate for very young (3-5 months) marasmic children who are kept on this diet for much longer periods until weight gain is sustained.

The full cream powdered milk in both mixtures A and B can be replaced with any available protein source egg, groundnut paste/powder, cray fish, or fish powder, soya beans, milk orange etc To produce equivalent amount of protein. How ever adjustments should be made in the quantities of other ingredient to ensure adequate caloric density of the final mixture.

In the dietary treatment of marasmus two things are needed

- (1) High calorie diet
- (2) High protein diet

If there is diarrhoea, foods containing such as minerals e.g iron potassium and sodium need to be incorporated in the diets. Also food that is high in vitamin such as liver, kidney, cod-liver oil should also be incorporated in the diet. Ground crayfish is a particularly good alternative to milk as it not only provides needed animai protein it also provide calcium which is also supplied by milk and which is required by growing children. Crayfish is readily available in local markets in most African countries

Table 1 Local fluid mixture for protein calorie malnutrition

Food ingredient	Kwash Pap A	Kwash Pap B
Soyabeans	75gm	100gm
Wheat	75gm	100gm
Groundnut	350gm	500gm
Egg	1	1
Orange	1	1

Palm oil	45gm	60gm
Bananna	Optional	Optional
Water	125ml	200ml
Sugar	35gm	50gm

Nutrition Unit (S.S.H.M)

METHODOLOGY

Methods of data collection were based on the following:-

1. Personal observation and monitoring
2. Medical record department
3. Two parameter monitor includes;-
 - i. Weight gain related to the weight upon admission
 - ii. Types of diet administered from admission unto discharge

METHOD

1. Winnow the wheat wash and sundry
2. Boil the soyabean for 15 to 20 minutes remove it and add cold water and squiz the back off
3. Shallow roast the groundnut and peel off the backs
4. Mill the wheat and soyabean together in to flour
5. Take the groundnut separately and mill it to pastes

PREPARATIONS

1. Take some quantity of groundnut paste mix with water filter it and bring to boil
2. Take same quantity of the wheat flour soyabean flour mixed with water ana pour it in to the boiling paste and stir, allow to boiled
3. Wash and squiz the orange with a squizer break the egg into the orange juice and beat it
4. Add it to the pap and gradually stir it fast so that the egg will not coagulate
5. Add sugar to taste add palm oil stir gently
6. Bring it down and serve it warm.

RESULT AND DISCUSSION

Result

The table below is a summary of personal observation and hospital record made available during the research.

Table 1: weight gain and diet therapy of a marasmus child from admission unto discharge.

Name of child: Umar Abubakar

Age of child: 2 years old

Weight of child upon admission: 5.5kg

Date of admission: 7/8/2020

Date of Discharge: 9/10/2020

Table 2: HOSPITAL RECORD AND PARAMETER MONITOR

DATE	WEIGHT(KG)	DIET ADMINISTERED
7/8/20	5.5	Kwash pap with moi - moi
8/8/20	5.5	Kwash pap with fresh fish cooked
9/8/20	5.6	Beans potage with liver mash
10/8/20	5.6	Egg custard with beans potage
11/8/20	5.7	Moi - moi with kwash pap
12/8/20	5.7	Moi - moi with kwash pap
13/8/20	5.8	Kwash pap and beans potage
14/8/20	5.8	Irish potatoes potage and kwash pap f
15/8/20	5.9	Fresh cow milk and moi - moi
16/8/20	5.9	Egg custard and banana
17/8/20	5.9	Egg custard and banana
18/8/20	10.0	Kwash pap and banana

19/8/20	10.0	Kwash pap with boiled egg
20/8 /20	10.1	Fresh fish cooked with beans
21/8/20	10.2	Irish potatoes with kwash pap
22/8/20	10.2	Kwash pap with moi-moi
23/8/20	10.3	Rich pap and fresh fish
24/8/20	10.3	Kwash pap and moi-moi
25/8/20	10.4	Kwash pap with banana
26/8/20	10.4	Kwash pap and live mashed
27/820	10.5	Beans potage and live mashed
28/8/20	10.5	Moi - moi with rich pap
29/8/20	10.6	Kwash pap and liver mashed
31/8/20	10.6	Kwash pap and beans potage
31/8/20	10.7	Kwash pap with moi-moi
1 st /9/20	10.7	Kwash pap with fresh fish
2/9/20	10.8	Irish potatoes and liver mash \
3/9/20	10.8	Irish potatoes and liver mash
4/9/20	10.8	Fresh cow milk and rich pap
5/9/20	10.9	Fresh fish with beans potage
6/9/20	10.9	Fresh fish with moi.-moi
7/9/20	11.0	Kwash pap and moi-moi
8/9/20	11.1	Kwash pap and moi - moi

9/9/20	11.1	Beans potage and liver mash
15/9/20	11.6	Beans potage and banana
16/9/20	11.7	Beans potage and orange
17/9/20	11.8	Kwash pap and moi-moi
18/9 /20	11.8	Kwash pap with fresh milk
19/9/20	11.9	Irish potatoes and banana
20/9/20	12.0	Beans potage and orange
21/9/20	12.2	Kwash pap with moi-moi
22/9/20	12.2	Kwash pap with moi-moi
23/9/20	12.3	Fresh fish with beans potage
24/9/20	12.4	Beans potage with fresh milk
25/9/20	12.4	Beans potage with fresh milk
26/9/Q&	12.5	Beans potage with orange
27/9/20	12.5	Kwash pap and liver mash
28/6/20	12.6	Kwash pap with moi-moi
29/6/20	12.8	Kwash pap with moi - moi
30/9/20	13.0	Beans potage and banana
1/10/20	13.1	Beans potage with egg custard
2/10/20	13.1	Kwash pap with fresh fish
3/10/20	13.1	Fresh cow milk with moi-moi
4/10/20	13.2	Multi mix diet with orange

5/10/20	13.2	Multi mix diet with banana
6/10/20	13.3	Egg custard with liver mashed
7/10/20	13.3	Beans potage with vegetable
8/10/20	13.4	Beans potage with orange
9/10/20	13.5	Irish potatoes with orange

The average weigh of the child is:-

$$\text{Average} = \frac{652}{64} = 10.19\text{kg,}$$

DISCUSSION

The child was brought to the state specialist hospital Maiduguri -on 7/8/20 at 10.00am, the child was a marasmus patient weighing 5.5kg. The child was given different types of drugs e.g like chloramphenicol syrup and paracetamol syrup, but was equally placed on high protein high calorie diet. The most common high protein, high calorie diet is kwash pap. Kwash pap is a mixture of wheat, groundnut, soya beans, palm c , orange, egg and sugar.

The important of given kwash pap or given those combination of food group is because it has both the high protein high calorie.

- * The high protein in it is:- groundnut palm oil, soya beans and
- * The high calorie diet like carbohydrates and wheat some of proteins is offered to the child.

$$\text{Expected weight} = \frac{\text{Actual expected weight for ace}}{\text{Using the formula provided by the physician}} = \frac{N + 9}{2}$$

for babies 0-9 months

for children between 1-5 years expected weight for age is

given by:-

$$\text{Expected weight} = 2N + 8$$

Based on the situation at hand

$$\text{Expected weight for age(2 years)} = 2 \times 4 + 8 = 8 + 8 = 16\text{kg}$$

Actual weight upon discharge = 13.5kg Thus the child is 2.5kg below the expected value, i.e % below the normal value. This is not too discouraging given the rate with which the weight gain progressed. It is believed that within the next two weeks or so the child will measure up to the expected weight.

CONCLUSION

This research has monitored the progress of a child admitted as marasmus patient and placed upon hospital diet the weight gain of 8 kg in 2 month was considered remarkable at the end of this period the child became lively and the signs of apathy had gradually decreased. The mother was also surprised at the progress within a very short time, she was advised on how to keep the child progressing when they reached home and she was taught how to prepared kwash pap at the Nutrition unit. It was obvious that ignorance of what to give to the child contributed to the disease condition.

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