CAUSES AND MANAGEMENT OF PROTEIN ENERGY MALNUTRITION IN CHILDREN (1-5 YRS) BELONGING TO THE REGION OF GURGAON (NCR)

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Abstract :

Protein-energy malnutrition (PEM) is a strong link with chronic disease and is associated with increased morbidity and mortality. Protein Energy Malnutrition (PEM) is widely prevalent face of malnutrition in children less than five years of age. It is still a major problem in India especially in urban slums.

The present study was conducted on hundred Preschool children 1-5 years of age attending Rural and urban Community Centre st Sohna and Gurgaon (NCR). The children were selected randomly. The clinical signs of all the selected subjects were recorded. The children had all the signs of malnourishment. The prevalence and causes of malnutrition were found out. It was based on interview cum questionnaire method which was applied on mothers of the children. After the Protein Calorie Malnutrition was ruled out , the treatment and management of the diseases was carried out by the investigator. The data showed that the subjects of Sohna had less income levels than Gurgaon city. The subjects belonged below poverty line and was earning less than 10.000/- per month.

According to the survey all the subjects belonging to rural and urban areas had very low birth weight from 1.5- 2.5 kgs. This was the main reason for the Protein Calorie Malnutrition. The other causes for PEM was poverty and around 70-78 per cent of subjects were living in poverty that is evident from their economic status as well. There was lack of knowledge about nutrition

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among the mothers and they were feeding starchy gruels, rice, potato to the children. Seventy – Eighty per cent of the subjects were consuming such type of diets. Mothers of all subjects were having irregular eating habits and they were skipping the meals of children as well. Timely weaning, education and promotion of essential vaccination was advised to reduce childhood malnutrition especially severe PEM. Feeding was started as soon as possible. The Diets provided 100 kcal/kg of energy and 1-1.5g/kg protein per day. The child was fed every two hours/ three hours and breastfeeding was also continued.

1.Introduction

The World Health Organization (WHO 1993) defines malnutrition as "the cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions.

Protein energy malnutrition (PEM) is a potentially fatal body depletion disorder (Dulger et al., 2002).The term protein energy malnutrition applies to a group of related disorders that include Marasmus, Kwashiorkor and intermediate states of Marasmic Kwashiorkor. Marasmus involves inadequate intake of protein and calories and is termed “the sickness of the weaning” with no oedema (De Onis et al., 1993). Kwashiorkor including Marasmic Kwashiorkor is characterized by massive Oedema of the hands and feet, profound irritability, Anorexia and Desquamative rash, Hair Discolouration and a large fatty liver (Manary and Brewster, 1997). Hypoalbuminaemia and Electrolyte imbalances have been put forward as possible causes of the Oedema (Ahmed et al., 2009).

PEM impairs the linear growth of children, leading to a further reduction in food intake, nutrient absorption, direct or catabolic nutrient losses and increased metabolic requirements. (Stephenson, 2000).

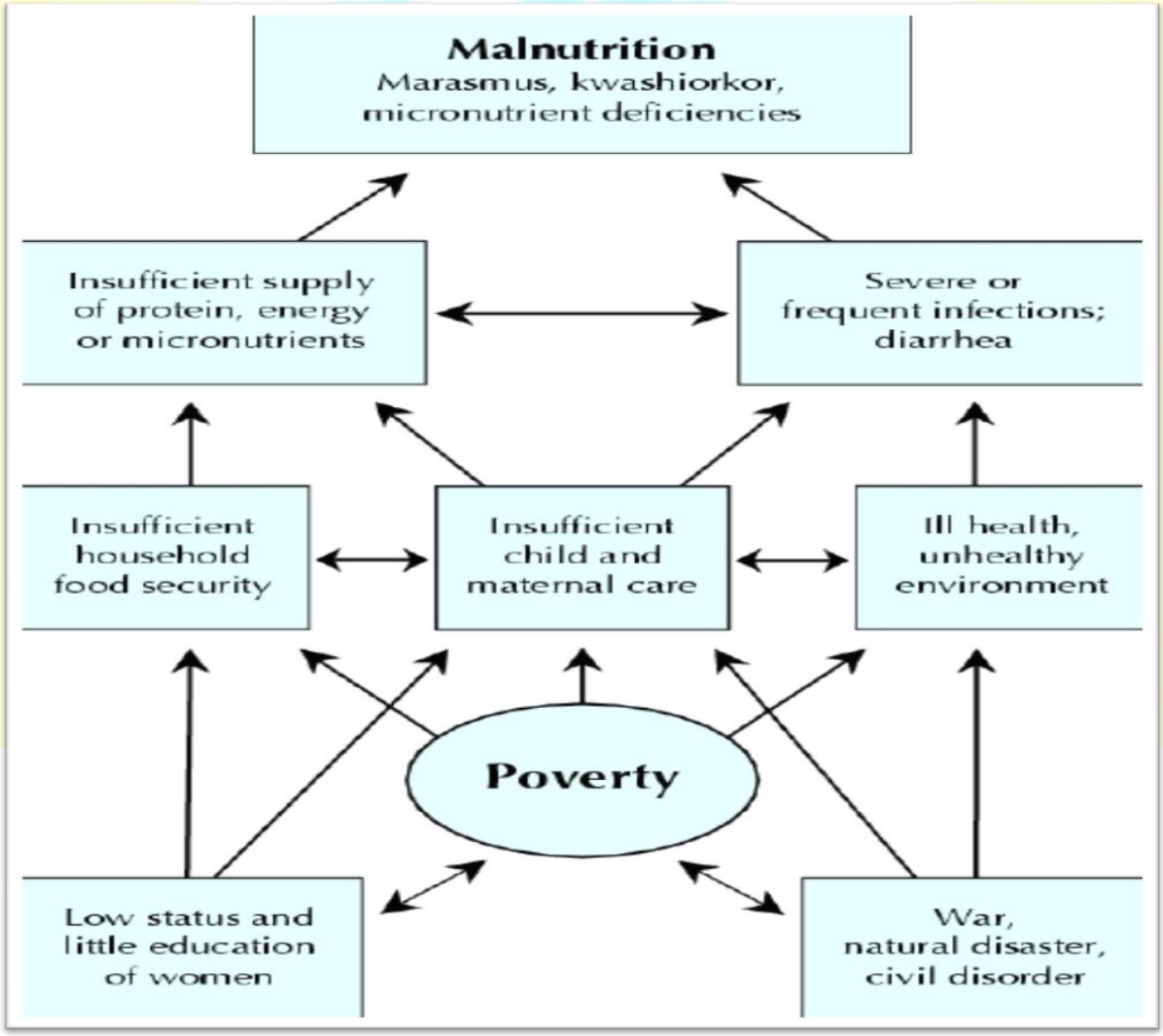
Initially, intravenous fluids are given to correct dehydration and electrolyte imbalance. Slowly, liquids, semi – solid foods are given over a period of days. Diet should be calorie dense and nutritious food should be given to accelerate growth and development .Eggs, milk and fruits should be a part of the daily meat. Immunization should be given it not been given before (Tehrani , 2010).

2.Review of Literature

In 2000 the W.H.O. estimated that malnourished children numbered 181.9 million [32%] in developing countries. In addition to an estimated 149.6 million children younger than 5 years, are malnourished when measured in terms of weight for age. In South Central Asia and eastern Africa about half the children have growth retardation due to protein energy malnutrition. This figure is 5 times the prevalent in Western Word.

*PEM – Protein Energy Malnutrition

Fig. 2.1 – Causes of PEM



3. Complication/Symptoms of Protein Energy Malnutrition:

3.1 Complication / Symptoms of Kwashiorkor:-

3.1.1 Moon Face

3.1..2 Oedema

3.1.3 Skin & Hair discolorations

3.1.4 Irritability

3.1.5 Diarrhea

3.2 Complication / Symptoms of Marasmus:

3.2.1 Stunted Growth

3.2.2 Severe muscle wasting

3.3 Complication / Symptoms of Marasmic Kwashiorkor:-

This is a severe wasting in the presence of Oedema. It is a mixed form of PEM, and manifests as Oedema occurring in children who may or may not have other signs of Kwashiorkor (Brewster, 1997; Manary *et al.*, 1998).

4. Materials and methods :

The purpose of this study was to see the association of dietary pattern and other factors with Protein Energy Malnutrition. The methods and materials used for investigation are discussed under the following headings:

4.1 Locale of Study :

The study was conducted on Preschool children attending Rural and urban Community Centres at Sohna and Gurgaon (NCR).

4.2 Selection of Subjects :

1) One hundred children's between 1 - 5 years of age were selected from different localities and institutions, namely – Sohna, and Gurgaon Movile NGO (NCR).

2) The height and weight of all the subjects were measured to find the malnourished subjects among them.

3) All the selected subjects were (i) Not following any dietary restrictions. (ii) The objective and experimental protocol of the study was explained to the subjects, and their prior consent was taken.

4.3 Experimental Plan :

The study was constituted of three phases and the classification of a subject was elaborated as under:

4.3.1 Phase I: The phase one includes 100 young children's for study. For this purpose field studies , clinical signs and symptoms as well as Dietary assessment were performed.

4.3.2 Field studies : These studies consists of collection of data regarding General information, Physical activity pattern , Health record, Assessment of Nutritional status by using Dietary survey, Anthropometry measurement. The interview cum questionnaire method was followed for the collection of responses. The clinical signs were seen in all the subjects as given in the complications of PEM.

5. Results and Discussions :

5.1 General Information:

5.1.1. Marital Status: The study indicated that parents of the subjects from Sohna and Gurgaon were hundred per cent married.

5.1.2. Family type: As indicated in the table below concludes that nuclear family system was more prevalent than Joint Family system. Mishra.et.al. (2013) also studied that modern lifestyle incorporated nuclear system.

5.1.3. Size of the Family: Due to rapid urbanization the unemployed youth is drifting apart from their families in rural areas in search of job opportunities , this leads to disturbed lifestyle

and food intake thereby leading to PEM in their children. In the present study, maximum number of subjects had medium and large family size.

5.1.4. Literacy level: Hundred per cent of males from Sohna region and ninety two per cent of Sohna & Gurgaon region were Intermediate. The literacy level of most mothers of the children was limited to XII standard.

Table No. 5.1: General Information of PEM subjects (n = 100)

Population Characteristics (1)	Response (2)	Number & Percentage			
		Male		Female	
		Sohna (n=25) (3)	Gurgaon (n=25) (4)	Sohna (n=25) (5)	Gurgaon (n=25) (6)
Mother's Marital Status	Single	0 (100%)	0 (100%)	0 (100%)	0 (100%)
	Married	25 (100%)	25 (100%)	25 (100%)	25 (100%)
Type of Family	Nuclear	5 (20%)	15 (60%)	4 (16%)	18 (72%)
	Joint	20 (80%)	10 (40%)	21 (84%)	7 (28%)
Size of Family	Small (3-4)	2 (8%)	9 (36%)	5 (20%)	10 (40%)
	Medium (5-7)	9 (36%)	10 (40%)	9 (36%)	12 (48%)
	Large	10	5	9	2

	(8-12)	(40%)	(20%)	(36%)	(60%)
	Very Large (>12)	4 (16%)	1 (4%)	3 (12%)	1 (4%)

Continued…

(1)	(2)	(3)	(4)	(5)	(6)
Literacy Level (mother)	Intermediate	25 (100%)	23 (92%)	25 (100%)	23 (92%)
	Graduate	0 (0%)	1 (4%)	0 (0%)	2 (8%)
	Post Graduate	0 (0%)	1 (4%)	0 (0%)	0 (0%)
Occupation (mother)	House wife	5 (20%)	17 (68%)	9 (36%)	15 (60%)
	Working	20 (80%)	8 (32%)	16 (64%)	10 (40%)
Economic Status of family	Family Income @ 3,000	4 (16%)	2 (8%)	5 (20%)	4 (16%)
	3,000 – 5,000	6 (24%)	8 (32%)	3 (12%)	5 (20%)
	5,000 – 6,000	4 (16%)	8 (32%)	5 (20%)	2 (8%)
	6,000 – 8,000	5 (20%)	3 (12%)	6 (24%)	3 (12%)

	8,000 – 10,000	5 (20%)	2 (8%)	3 (12%)	4 (16%)
	> 10,000	1 (4%)	2 (8%)	3 (12%)	7 (28%)

5.1.5. Occupation: The data showed that the percentage of housewives and working mothers was almost at same level. The mothers were basically working as Anganwadi workers, pre school teachers and household maids.

5.1.6. Economic Status: The study reported that the subjects of Sohna had less income levels than Gurgaon city. The subjects belonged to below poverty line and were earning less than 10.000/- per month.

5.2. Causes of PEM

5.2.1. Birth Weight: According to the survey all the subjects belonging to rural and urban areas had very low birth weight from 1.5- 2.5 kgs. This was the main reason for the protein calorie malnutrition.

5.2.2. Poverty: Around 70-78 per cent of subjects were living in poverty that is evident from their economic status as well.

5.2.3. Starchy food consumption: Lack of knowledge about nutrition among the mothers was prevalent. They were feeding starchy gruels, rice, potato to the children. Seventy – Eighty per cent of the subjects were consuming such type of diets.

5.2.4. Irregular Meals or Eating Habits: Acoording to tha data , the mothers of all subjects were having meals two times a day.

5.2.5 Lack of food: The feedings were skipped during the day by the subjects due to lack of availability of foods. The children were facing hunger and lack of food.

Table No. 5.2.: Causes of Protein Energy Malnutrition subjects (n = 100)

Population Characteristics (1)	Response (2)	Number & Percentage			
		Male		Female	
		Sohna (n=25) (3)	Gurgaon (n=25) (4)	Sohna (n=25) (5)	Gurgaon (n=25) (6)
Birth Weight (kg)	1.5 -2.5	11 (44%)	12 (48%)	12 (48%)	11 (44%)
	2.6 – 3	10 (40%)	10 (40%)	8 (32%)	11 (44%)
	3.1-3.5	4 (16%)	3 (12%)	5 (20%)	3 (12%)
Poverty	Yes	18 (72%)	16 (64%)	17 (68%)	19 (76%)
	No	7 (28%)	9 (36%)	8 (32%)	6 (24%)
Starchy food consumption	Yes	20 (80%)	21 (84%)	18 (72%)	19 (76%)
	No	5 (20%)	4 (16%)	7 (28%)	6 (24%)

Continued…

(1)	(2)	(3)	(4)	(5)	(6)
Irregular Meals (mother)	2 meals per day	11 (44%)	12 (48 %)	15 (60%)	5 (20%)
	3 meals per day	8 (32%)	5 (20%)	5 (20%)	11 (44%)
	> 3 meals per day	6 (24%)	8 (32%)	5 (20%)	9 (36%)
Lack of food	1 time a day	8 (32%)	9 (36%)	7 (28%)	9 (36%)
	2 times a day	4 (16%)	10 (40%)	8 (32%)	4 (16%)
	3 times a day	9 (36%)	4 (16%)	7 (28%)	5 (20%)
	No feeding per day	4 (16%)	2 (8%)	3 (12%)	7 (28%)

6. Management / Treatment of Protein Energy Malnutrition:

As soon as children are able to take normal food and infection is under control, it is economical for medical services to discharge them to a centre where their nutritional rehabilitation can be supervised. Follow up studies were done at the Institute of Child Health. Hospital for children at Chennai revealed that one – third of the children who had been treated in hospital for PEM were dead within a year from the disease for which they had been successfully treated and still others were malnourished. Causes can be attributed to poverty or failure to involve parents particularly

mother in treatment and recovery. The concept of nutritional rehabilitation is based on practical nutritional training for mothers in which they learn by feeding their children back to health, under supervision and using local food

6.1 Weaning food:-

The Study conducted on Weaning stated that Weaning food should be started at 4 Months. Low household income, parental illiteracy, small family size, early or late weaning and absence of BCG vaccination were significantly associated with severe PEM. Timely weaning, education and promotion of essential vaccination were advised to reduce childhood malnutrition especially severe PEM.

6.2 Start cautious feeding:-

Feeding was started as soon as possible. The Diets provided 100 kcal/kg of energy and 1-1.5g/kg protein per day. The child was fed every two hours/ three hours and breastfeeding was also continued. Volume and energy of feeds was increased gradually; initially child was fed on F-75 diet. Feeding pattern for initial days of rehabilitation is summarized in the table

Table 3 : Feeding pattern in initial days of rehabilitation

Day	Frequency	Vol/kg/feed	Vol/kg/day
1-2	2nd hourly	11ml	130ml
3-5	3rd hourly	16ml	130ml
6th day onwards	4th hourly	22ml	130ml

7.Conclusion :

This study observed that increase in inflammatory response in children with PEM with weight being a significant indicator of PEM in the subjects. The impact of dietary intervention on this

study shows the ability of nutritional intervention to achieve improved immunity, promote growth, general well-being and development of malnourished children. Above all, the impact of the level of education and the socio-economical status of the mothers of malnourished children in this study was clearly evident.

7.1 Management of PEM :

7.1.1 Nutritional support strategy:-

Follow French National Nutrition Health Programme (PNNS) advice for the elderly:

Technical or human assistance during meals.

Oral care.

A reassessment of the appropriateness of diets.

- Meat, fish or eggs: 2 servings a day.

- Milk and dairy products: 3 to 4 servings a day.

- Bread, other cereal foods, potatoes or pulses at each meal.

- At least 5 portions of fruit and vegetables every day.

- 1 to 1.5 litres of water a day (or other drinks: herbal tea, fruit juice, etc) and drinking before feeling thirsty.

7.1.2 Fortified foods:-

Fortified foods are used to increase the energy and protein intake of a meal without increasing its volume. They are obtained by enriching traditional food with products such as milk powder, whole milk concentrate, grated cheese, eggs, fresh cream, melted butter, oil, or industrial protein powders.

7.1.3 Oral nutritional supplement (ONS):-

High-energy and/or high-protein ONS also exist with different tastes, with or without lactose, and with a variety of textures (liquid, cream, etc). Several types of product are available including dairy desserts, soups, complete meals, fruit juice, etc.

ONS are prescribed as follows:- ONS may be eaten as snacks or during meals. They must be eaten in addition to meals and not instead of meals. When they are provided during mid morning or as evening snack, they should be given about 2 hours before or after a meal in order not to spoil appetite during meals.

The ONS prescription should supply an additional food intake of 400 kcal/day and 30g protein/ day; this generally requires two units per day.

7.1.4 Practical Nursing for Infant Feeding

There are five rules that can largely prevent protein-energy malnutrition in educating mothers or other caregivers in-group or individually:-

1. Breast-feed at least until 1-2 years is recommended.

2. Start thick porridge, paste or gruel at 4 months with continued breastfeeding.

3. Use all available animal food sources.

4. Use vegetable (cereals & legumes) mixture.

5. Give children four good meals a day.

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