Evaluation of nutritional & educational intervention as KAP and outcome of children with SAM (6 Months - 5 years) in malnutrition treatment center

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Abstract:- The present study was conducted fromjuly 2014 to June 2015 at malnutrition treatment center of paediatric department of S.M.S. medical college Jaipur.. Ninety children admitted during this period were analyzed about the effect of interventional measures on selected anthropometric indicators. Mothers of the children were interviewed on health issues and therapeutic feeding practices at the MTC using a predesigned and pretested interview schedule.

The mean Age of the study population was 17.14 ± 11.61(6 to 60 months). The Male to female ratio was 1.36:1 (M=52.78% and F=42.22%). Mean duration of hospital Stay was14.97 ± 5.31(3 to 30 days). The overall mean weight of admission for these children was 5.91 ± 1.64 kg; for boys 6.09 ± 1.66 kg and for girls 5.66 ± 1.597 kg. The mean mid upper arm cercumference(MUAC) at admission was 11.32 ± 1.18 cm, for boys 10.134 ± 1.22 cm and for girls was 9.89 ± 1.4869 cm. The mean head circumference (HC) at admission was 40.63 ± 2.11 cm, chest circumference (CC) was 40.13 ± 1.32cm and lenth (L) at admission was 70.18 ± 8.78cm.

The mean weight at discharge for the study group was 6.565 ± 1.778 kg; for boys 6.79 ± 1.80 kg and for girls was 6.86 ± 1.711 kg. The mean MUAC at discharge was 10.87 ± 1.38 cm, for boys 11 ± 1.166cm and for girls was 10.7 ± 1.639 cm. The mean HC at admission was 40.64 ± 2.11 cm, CC was 39.68 ± 4.32cm and length was 70.18 ± 8.78cm.

The prevalence of acute severe malnutrition is still very high and mortality and morbidity of these patients can be reduced significantly if managed properly by nutritional and medical means in hospital especially in malnutrition treatment corner. Nutritional education should be given to parents while they stay in MTC so that after discharge from hospital they can feed their child efficiently and regularly at home.

Keywords:- Malnutrition treatment center, severe acute malnutrition, nutritional education, knowledge attitude and practice (KAP).

I. Introduction

Childhood malnutrition is an important public health challenge. Malnourished children have significantly higher risk of mortality and morbidity. Besides increasing the risk of death and disease, malnutrition also leads to growth retardation and impaired psychosocial and cognitive development. PEM affect every fourth child worldwide and more than 70% of them live in Asia.

Children with severe acute malnutrition (SAM) have nine times higher risk of dying than well nourished children. In India, the prevalence of SAM in children remains high despite overall economic growth. The NFHS-3 revealed that 6.4% of all children under-five years of age are severely wasted[1].

According to NFHS -3 (2005-06) in India
* 43% children under age of five years are under weight (low weight for age).
* 48% children under five years are stunted (low height for age).
* 20% children under five years of age are wasted (low weight for height), 6.4% of these children are severely wasted (<-3SD). Since wasting'denotes acute malnutrition, these children are said to have SAM.

- Nearly 70% children (age 6months-5years) have anaemia. Of these 26% have mild anaemia, 40% have moderate anaemia and 3% have severe anaemia[2].

To prevent deaths among severe malnourished children the Government started the malnutrition treatment centers (mtcs) with support from UNICEF. The objectives of the program are to control malnutrition among the children aged 6 months to 5 years and to bring down the percentage of severe malnourished children to less than 1%.[3]

The present work tries to analyze the effect of the mtcs in improving the health and nutritional status of severe malnourished children admitted at the centers by studying the effect of the interventional measures on the admitted children and the effect of health education measures undertaken at the centers.

II. Material And Method

Study site: The present study was conducted in Malnutrition Treatment Center at the department of Pediatrics, SPMCHI, SMS medical college, Jaipur.

Study design: Hospital based observational analytical study.

Duration of study: One year from July 2014 to June 2015.

Sample size: The study will be conducted on a predecided sample size of 90 children aged between 6 months to5 years admitted to the mtcs at SPMCHI, Jaipur

Inclusion criteria: Any child (aged 6 month to 5year) fulfill any of following criteria included .
1. Weight for Height <3SD
2. Visible Severe Wasting
3. Mid Arm Circumference (MUAC) <11.5cm.
4. Edema of both feet

Exclusion criteria:
1. Drop outs from the study due to LAMA.
2. Parents/caretaker refused for consent.
3. Chronic malnutrition due to systemic illness.

The mtcs was visited by the investigators at periodic intervals during the months of July 2014– June 2015 and all children admitted at that particular day of the visit were included in the study. Once the figure of 90 was achieved the process of recruitment was stopped.

All SAM patients satisfying the above criteria were selected as cases and full history, examination and anthropometry were recorded at admission and discharge in a pre designedproforma.

Weight at the time of admission and discharge were recorded; average weight gain were calculated to see if it was in accordance with the available guidelines[4]. Appropriate statistical tests were applied to ascertain any significant difference between the mean weights at discharge and the mean weight at admission for the study group. In addition, the MUAC and grades of malnutrition at admission and discharge were also be recorded and the average duration of stay at the centers were studied to establish any difference amongst the different age groups.

A predesigned and pretested semi-structured interview schedule was used to interview the mothers/parents of the admitted children on awareness regarding government programs focusing on nutrition, basic concepts of nutrition, etiologies of malnutrition, and the impact of hands on training provided at the center, which focused on the composition and preparation of therapeutic diets at the center.

Observations and results

Total 90 cases were included in study out of them females were 38 and males were 52. The mean age of the study population was 17.14 ± 11.61 (6 to 60 months); for boys 21.90 ± 5.842 months and for girls 15.05 ± 4.556 months. Maximum proportion of the cases were observed in 7 to12 m (45.56%) followed by 13 to24 m (35.56%) of the age groups.

Table No-1
Distribution of the cases according the sex

Sex	No	%
Female	38	42.22
Male	52	57.78
Total	90	100.00

- The Male :female ratio was 1.36:1
- (M=57.78% and F=42.22%)

Table No -2
Distribution of the cases according the age group

Age Groups	No	%
0 to 6 months	4	4.44
13 to 24 months	32	35.56
25 to 36 months	8	8.89
37 to 48 months	2	2.22
49 to 60 months	3	3.33
7 to 12 months	41	45.56
Total	90	100.00

Table no-3
Anthropometric parameters at the time of admission

At the time of Admission (A)					
	N	Minimum	Maximum	Mean	Std. Deviation
Weight in kg	90	3.00	10.99	5.91	1.64
MUAC in cm	90	5.50	12.50	10.03	1.34
HC in cm	90	37.50	48.60	40.63	2.11
CC in cm	90	38.00	46.00	40.13	1.32
Lenth in cm	90	56.00	100.00	70.18	8.78

The overall mean weight of admission for these children was 5.91 ± 1.64 kg; for boys 6.09 ± 1.66 kg and for girls 5.66 ± 1.597 kg.
The mean MUAC at admission was 11.32 ± 1.18 cm, for boys 10.134 ± 1.22 cm and for girls 9.89 ± 1.4869 cm.
The mean HC at admission was 40.63 ± 2.11 cm, CC was 40.13 ± 1.32 cm and Length was 70.18 ± 8.78 cm

Table no-4
Anthropometric parameters at the time of discharge

At the time of Discharge (D)					
	N	Minimum	Maximum	Mean	Std. Deviation
Weight in kg	90	3.50	12.20	6.5659	1.77872
MUAC in cm	90	5.80	13.00	10.8767	1.38573
HC in cm	90	37.50	48.60	40.6461	2.11413
CC in cm	90	1.00	46.00	39.6867	4.32467
Length in cm	90	56.00	100.00	70.1778	8.78018

The mean weight at discharge for the study group was 6.565 ± 1.778 kg; for boys 6.79 ± 1.80 kg and for girls 6.86 ± 1.711 kg. The mean MUAC at discharge it was 10.87 ± 1.38 cm, for boys 11 ± 1.166 cm and for girls 10.7 ± 1.639 cm. The mean HC at admission was 40.64 ± 2.11 cm, CC was 39.68 ± 4.32 cm and Length was 70.18 ± 8.78 cm.

Table no-5
Subjective assessment before and after intervention/ Awareness and Knowledge amongst mothers/parents of the admitted children regarding therapeutic feeding practices followed at mtcs (*n*=90)

	Variable	Before		After		Chi Square Test
		No	%	No	%	P Value
1	Awareness of the existence of mtcs	7	7.78	90	100	<0.001
2	Knowledge about the various types of nutrients their importance	1	1.11	33	36.67	<0.001
3	Preparation and use of Oral Rehydration Solution (ORS	25	27.78	74	82.22	<0.001
4	Knowledge about the clinical symptoms of vitamin A deficiency	0	0.00	26	28.89	<0.001
5	Knowledge about the etiologies of malnutrition	5	5.56	41	45.56	<0.001
6	Knowledge of balanced diet	0	0.00	46	51.11	<0.001
7	Importance of repeated infection in development of malnutrition	40	44.44	90	100.00	<0.001
8	Lack of immunization leads to malnutrition	0	0.00	77	85.56	<0.001
9	Mother had been taught the preparation of the therapeutic diets at the centers	0	0.00	22	24.44	<0.001
10	Proper information regarding the time interval of feeds	0	0.00	82	91.11	<0.001
11	Knowledge about F-75 diet	0	0.00	6	6.67	<0.001
12	Knowledge about F-100 diet	0	0.00	2	2.22	<0.001
13	Knowledge about the lactose-free diets	0	0.00	0	0	NA

Awareness regarding community programmes on nutrition and concepts of nutrition Though 7.78% of the mothers were aware of the existence of nutritional rehabilitation centers (nrcs), most of them were ignorant about the actual name of the center. 1.11% had some knowledge about the various types of nutrients and their importance, 27.78% correctly knew about the preparation and use of Oral Rehydration Solution (ORS), 0% of the mothers had proper knowledge about the clinical symptoms of vitamin A deficiency. But at the time of discharge significant improvement was observed about community programmes on nutrition and concepts of nutrition.

Awareness regarding etiology of malnutrition
94.54% of the mothers had no knowledge about the etiologies of malnutrition but at the time of discharge 45. 56% had knowledge which was significant (P<0.001).

Knowledge regarding therapeutic feeding practices at nrcs
24.44% of the mothers said that they had been taught the preparation of the therapeutic diets at the centers. Though majority (91.11%) of mothers had proper information regarding the time interval of feeds at the nrcs, just 6.67% had correct knowledge (the correct constituents and correct method of preparation) about F-75 diet and 2.22% about F-100. None of the mothers had any knowledge about the lactose-free diets

III.   Discussion
Children Protein energy malnutrition (PEM) predominantly seen between infancy and childhood i.e. From 6 months to 60 month of age. Severe malnutrition is not only an important cause of morbidity and mortality, but also leads to permanent impairment of physical and possibly mental growth of those who survive. Optimal management of these acutely ill children and a good outcome depends on an evidence based regimen of care. In addition to critical care, a nutritional therapy followed by nutritional rehabilitation is a very important aspect for these.

According to recent national family health survey prevalence of severe acute malnutrition is 6.4%. This high prevalence is due to lack of awareness about malnutrition in community specially in rural population due to high illiteracy level of mothers and lower socioeconomic status of family. Since NFHS is community based while our study was hospital based and in India parents generally do not seek medical advice for these malnourished children until unless they suffer from some of the acute complications of SAM e.g. Diarrhea, vomiting, bronchopneumonia, fever, convulsion, skin infection etc.

In our study, out of total 90 patients,the mean age of the study population was 17.14±11.61 (6 to 60 months), for boys 21.4± 5.842 months and for girls 15.05 ± 4.556 months. Maximum proportion of the cases were observed in 7 to12 months of age (45.56%) followed by 13 to24 months (35.56%) of the age groups. **Rey et al (2000)**[5]observed that mean Z-scores for weight and height by age shows that lowest values occur around 18 months of age in both sexes. **Sharma (2004)**[6]in his study also reported that prevalence of malnutrition is significantly high in children less than 24 months of age. Similarly, **Mamidi et al**[7] in their study on hospital based treatment of severe malnutrition reported that 71.1% of children were below 24 months of age. In initial 2 to 3 year of life rapid growth occurs and requirement of substrates for energy and building of tissue also increases, thus deficiency of protein, energy and other micronutrients in these year results in malnutrition. In our study males were more than females (57.78% v/s 42.2%) with a ratio of 1.36:1. Similar to our study, **Ashraf et al (2001)**[8]reported that malnutrition is relatively more common in males as compared to that of females (53.7% v/s 46.3%). Likewise, **Anejaetal**[9]in their study on malnutrition observed that 55.5% of children were males as compared to females (44.5%). But **Joshi and Walgankar (2004)**[10]observed that incidence of malnutrition was higher in females (78%) as compared to that in males (22%). **Singh et al (2006)**[11]and **Ray et al (2000)** reported that extent of malnutrition was significantly higher in girls than boys i.e. (p<0.05) and (p<0.01) respectively. This difference may be due to the fact that **Joshi and Walgankar, Singh et al and Ray et al** did field studies in general population where malnutrition is more common in female counterpart as compared to male whereas **Ashraf et al, Aneja et al** and present studies were hospital based where male patients were more than female which might be due to the fact that male children are bought to hospital early and are given more importance. Moreover male child gets more medical attention than female and in rural area parents usually does not seek medical advice for female child. Ritual and social norms are also responsible for it.

In our study the average duration of stay at the mtcs was 14.97±5.31 (3 to 30 days). No statistically significant difference was observed among the different age groups with respect to duration of stay at the centers (F=1.611, P>0.001).

Out of 90 patients, the overall mean weight of admission for these children was 5.91 ± 1.64 kg; for boys 6.09 ± 1.66 kg and for girls 5.66± 1.597 kg. The mean MUAC at admission was 11.32 ± 1.18 cm, for boys 10.134 ± 1.22 kg and for girls 9.89± 1.4869 kg. The mean HC at admission was 40.63± 2.11 cm, CC was 40.13±1.32cm and length was 70.18±8.78. The mean weight at discharge for the study group was 6.565± 1.778 kg; for boys 6.79± 1.80 kg and for girls 6.86 ± 1.711kg. The mean MUAC at discharge it was 10.87 ± 1.38 cm, for boys 11 ± 1.166 kg and for girls 10.7± 1.639 kg. The mean HC at admission was 40.64± 2.11 cm, CC was 39.68±4.32cm and length was 70.18±8.78. Among all Anthropometric indicators weight was significantly changed in positive direction % change in weight was 0.656±0.454 kg and MUAC was 0.842 ±0.686 cm .

The nutritional status of these children at entrance was not different from the nutritional status of the children who were discharged. Occupation of parents, illiteracy of caretaker, lower socioeconomic status and large family size were the main contributing factors for malnutrition in these children.

Consequently, treatment acceptability to the mother or other caretakers also has to be considered as a major factor. To improve the outcome in such center, the most important aim is to reduce the rate of children who absconded. This can be done by educating the mothers about nutritional requirement for their children and let the mothers to know that all the problems of her children are due to faulty dietic habits that lead to malnutrition and make the child vulnerable for different diseases and infections. Benefits of therapeutic nutrition must be clear to caretakers that well balanced diet in hospital and at home is the key to good health of their children. We have to keep in mind the fact that keeping the mother and child longer in the MTC increases the risk of increasing absconding rate. The reduction of the duration of stay should also be balanced with possibility of praparing the mother to manage the recovery phase at home. At this point ,it is very important to increase knowledge,attitude and practice about etiophathogenesis and importance of dietary habits to combait malnutrition. For that we organisedainterveiw schedule in form of questionairs for caretakers, at the time of admition and at the time of discharged, to knowing about the health education and prepration of therapeutic diet at MTC. In our study result was in positive direction.

In our study Awareness regarding community programs on nutrition and concepts of nutrition:
Though7.78% of the mothers were aware of the existence of nrcs, most of them were ignorant about the actual name of the center. 1.11% had some knowledge about the various types of nutrients and their importance, 27.78% correctly knew about the preparation and use of Oral Rehydration Solution (ORS), 0% of the mothers had proper knowledge about the clinical symptoms of vitamin A deficiency.but at the time of discharge significant improvement was observedawareness regarding community Programs on nutrition and concepts of nutrition.

Awareness regarding etiology of malnutrition: 94.54% of the mothers had no knowledge about the etiologies of malnutrition but at the time of discharge 45.56% had knowledge which was significant (P<0.001).

Knowledge regarding therapeutic feeding practices at MTC: 24.44% of the mothers said that they had been taught the preparation of the therapeutic diets at the centers. Though majority (91.11%) of mothers had proper information regarding the time interval of feeds at the MTC just 6.67% had correct knowledge (the correct constituents and correct method of preparation) about F-75 diet and 2.22% about F-100. None of the mothers had any knowledge about the lactose-free diets.

IV. Conclusion

Finally it can be concluded that prevalence of acute severe malnutrition is still very high and mortality and morbidity of these patients can be reduced significantly if managed properly by nutritional and medical means in hospital especially in therapeutic feeding center i.e. Malnutrition treatment corner. Hospital based management of these children in specialized feeding center is very important for regaining lost weight and recovery from active diseases. Home based rehabilitation without supervision is associated with sub-optimal and slow recovery. So there is strong need to educate the parents, especially mothers about nutritive diets that they can prepare at home with available means or can be purchased from market at low cost . Nutritional education should be given to parents while they stay in MTC so that after discharge from hospital they can feed their child efficiently and regularly at home. Apart from nutritional education, importance of breast feeding, time of weaning, birth spacing, family planning, immunization and literacy, have to be realized to the parents. It is very important to communicate to the policy planners the urgency to address the problem of severe acute malnutrition.

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