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Research Paper

Assessment of Factors Predisposing to Acute Malnutrition Among Under - Five Children Attending Tertiary Care Hospital.

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ABSTRACT:- *Maternal nutrition, Low birth weight and recurrent infections are other important factors that lead to malnutrition. The aim of the present study is to assess the predisposing factors association in relation **to** the Malnutrition children, especially **S**evere **A**cute **M**alnutrition. A total of 108 patients presenting with features of Malnutrition were selected as per WHO growth standards. All the details regarding children and their family details were entered in excel sheet and results were analyzed. Among 108 study children, Severe Acute Malnutrition (SAM) were observed in 61 children (56.4%) and Moderate Acute Malnutrition (MAM) was observed in 47 children(43.5%). Among SAM children males (67.2%) were predominantly observed when compared to females (32.7%). Severe Acute Malnutrition was observed in more number among not immunized children (68.7%), low birth weight children (63.6%), < 2 years interval between two pregnancies (68.4%), children with medical complications (65.2%). Children with or without medical complications in relation to SAM and MAM is statistically significant. Malnutrition incidence can be decreased with simple measures by educating mothers about health care, hygiene measures, Feeding habits, immunization, seeking treatment at right time.*

Keywords:- *Malnutrition, Predisposing factors, Severe Acute Malnutrition.*

I. INTRODUCTION

Majority of the children in India who live below the poverty line in an environment of multi deprivation and starvation have physical and developmental retardation. It has be estimated that in India, 65 percent i.e., nearly 80 million children under five years of age suffer from varying degrees of Malnutrition [1].

Sociodemographic factors like neglect of the girl child, large family size and lack of child spacing and family welfare methods have an adverse effect on child survival and child development. Environmental factors like parenteral education, socioeconomic status, sanitation, standard of living, parental attitudes and child rearing practices influence the growth and development of children. Nutritional factors like improper breastfeeding practices during first year of life [2], weaning practices and diet during illness influence the growth and development of children.

Maternal nutrition, Low birth weight and recurrent infections are other important factors that lead to malnutrition. Malnutrition increases morbidity and mortality among under five children throughout the world [3]. Total development of the child is influenced by genetic, environmental and nutritional factors.

Severe acute Malnutrition is defined by very low weight-for-height/length (Z-score below -3 SD of the median WHO child growth standards), and/or a upper arm circumference (MUAC) <115 mm and/or by the presence of nutritional edema and/or visible wasting among 6-59 months and in infants <6 months also by noticing feeble to suckle effectively.

Moderate Acute Malnutrition also known as wasting, is defined by a weight -for-height indicator between -3 and -2 z-scores (standard deviations) of the international standard or by a mid-upper arm circumference (MUAC) between **115** mm and 125 mm.

Mortality rate associated with moderate wasting is about 30 to 148 per 1000 children per year and severe wasting is about 73 to 187 per 1000 children per year.[4,5].

The aim of the present study is to assess the predisposing factors association in relation to the Malnutrition children, especially severe acute malnutrition.

II. MATERIALS AND METHODS

Children were selected for study who were under five years of age and presenting with features of Malnutrition, admitted in Nutrition Rehabilitation Centre (NRC), Department of Pediatrics, Government Medical College, Ananthapuramu. This is a prospective study conducted for one year (May 2015 to April 2016) after taking informed consent from parents or guardians of studied children. Ethical committee approval has taken.

Children with chronic disorders like congenital heart disease, severe mental retardation, chronic liver and renal disease were excluded from study.

A total of 108 patients presenting with features of Malnutrition were selected as per WHO growth standards [6]. These children were underwent general examination, those with acute medical complications were admitted in PICU and were investigated to diagnose and treat the condition accurately. After recovery of children they were transferred to Nutrition Rehabilitation Centre (NRC). Medical complications and number of days in PICU were noted. Those children who have no medical complications or mild problems were treated in NRC itself.

All the patients details such as age, sex, immunization status, interval between two pregnancies, birth weight, preterm or term delivery, maternal age, maternal education, paternal age, paternal education, occupation, monthly income, feeding habits, weaning, prelactal feeds has taken and also entered into the excel sheet for analysis.

Weight -for-height/length, MUAC, Z score, edema were observed in all patients in the age group of 6-**59 months.**

All the details regarding children and their family details were entered in excel sheet and results were analyzed. Statistical analysis was done using danielSoper.com to find the P value after calculating chi square and degree of freedom.

Counseling has given to parents regarding hygienic practices, nutritional improvement and immunization.

III. RESULTS

A total of 108 children with features of Malnutrition were selected for this study. Among 108 study children, Severe Acute Malnutrition (SAM) were observed in 61 children (56.4%) and Moderate Acute Malnutrition (MAM) was observed in 47 children(43.5%). Malnutrition was more commonly noticed in the age group of 13-24 months, was 47.2% followed by **6**-12 months (27.7%) (Table.1). Male and Female children were almost equally affected with Malnutrition.

Out of 56 Males SAM and MAM was observed in 41 (73.2%) and 15 (26.7%) children respectively (Fig.1). Among SAM children males (67.2%) were predominantly observed when compared to females (32.7%).

Various Predisposing factors were analyzed in Malnutrition children. Out of 108 children, 92 (85.1%) were immunized and 86 (79.6%) were under normal birth weight (Table.2). 72 (66.6%) children were presented with various medical complications like Gastroenteritis, anemia, respiratory tract infections and few of those children were also treated in PICU. Among 108 studied population, 8 members were **Primipara,** those remaining 100 members were assessed for time interval between two successive pregnancies.

Severe Acute Malnutrition was observed in more number among not immunized children, low birth weight children, < 2 years interval between two pregnancies, children with medical complications.

On statistical analysis, significance of various predisposing factors were analyzed in relation to SAM and MAM children (Table.3). Children with or without medical complications in relation to SAM and MAM is statistically significant.

Maternal age was assessed among 108 studied group, 80 were 15-25 years, 27 were 26-35 years and one were >35 years. 65 (60.1%) mothers were educated and 43 (39.8%) were illiterate. Mothers education was assessed in relation to SAM and MAM, which was statistically significant.

Various Feeding habits like first feeding, exclusive breast feeding and weaning were assessed among Malnutrition children. Severe Acute Malnutrition was observed most commonly among children who was fed first time after 12 hours, exclusive breast feeding was given < 4 months, weaning has started by 4 months (defective weaning), feeds < 6 times/day, no proper mixed diet (Table.4).

Socioeconomic status was assessed by Modified Kuppuswamy classification (Fig.2). Malnutrition children were commonly observed in Upper lower class (67.5%) followed by Lower middle class (27.7%). No cases was observed in Upper class.

IV. DISCUSSION

Malnutrition is a preventable condition, India is one among 20 countries suffering from Malnutrition. Not only nutritional supplement, needs various other factors like health care, hygiene, proper immunization, quality weaning, breast feeding habits etc., required to decrease the incidence of Malnutrition.

Among 108 study children, Severe Acute Malnutrition (SAM) were observed in 61 children (56.4%) and Moderate Acute Malnutrition (MAM) was observed in 47 children (43.5%). Malnutrition was more commonly noticed in the age group of 13-24 months, was 47.2% followed by 0-12 months (27.7%).

In this study among SAM children, males (67.2%) were predominantly observed when compared to females (32.7%). Shweta Goyal et al [7] also observed that SAM was most common in male children and also documented that in India female children were lesser in number to seek the medical advice when compared to male children.

In this study majority of the children were immunized, among unimmunized children majority were SAM. 72 (66.6%) children were presented with various medical complications like Gastroenteritis, anemia, respiratory tract infections and few those were also treated in PICU. Few studies documented that SAM is associated with unimmunized children[8,9].

Severe Acute Malnutrition was observed in more number among not immunized children, low birth weight children, < 2 years interval between two pregnancies, children with medical complications. Children with or without medical complications in relation to SAM and MAM is statistically significant.

Maternal illiteracy was assessed in relation to SAM and MAM, which was statistically significant as per this study. Many studies has shown that there is an increase in SAM incidence with maternal [10] and paternal illiteracy [11-13].

In this study Severe Acute Malnutrition was observed most commonly among children who was fed first time after 12 hours, exclusive breast feeding was given < 4 months and weaning has started < 4 months. Other studies like Solomon asmalu et al [13], Shweta Goyal et al [7] also supports our study and documented that feeding practices were significantly associated with SAM. Recommendation by global public health is exclusive breast feeding for first 6 months and weaning can start at 6th month with safe complementary feeds and breast feeding should continue up to 2 years or beyond[14]. In this study, Severe Acute Malnutrition were observed more commonly among children who has not fed with mixed diet (Complementary feeds) according to their age and among those who has fed less frequently per day.

Malnutrition children were commonly observed in Upper lower class (67.5%) followed by Lower middle class (27.7%) in the present study. Other studies also shown that malnutrition is associated with poor socioeconomic status [7, 15,16]]. Solomon amsalu et al [13] observed that maternal and paternal illiteracy, less monthly income, larger family size were associated socioeconomic risk factors for severe acute malnutrition.

Malnutrition is a multi factorial condition, to decrease the incidence single point interventions like nutritional supplementation, primary health care are not sufficient. There is a greater need to implement multi interventional strategies to reduce the burden of malnutrition in India. Combined approach by various factors such as genetic, environmental and nutritional will enhance the growth and development of children.

V. FIGURES AND TABLES

Table No:1: Age and Sex wise distribution of Malnourished children

Age group	Male		Female		Total
	Number	Percentage	Number	Percentage	
6- 12 months	15	26.7%	15	28.8%	30
13 - 24 months	26	46.4%	25	48%	51
25 - 36 months	11	19.6%	5	9.6%	16
37 - 48 months	2	3.5%	5	9.6%	7
49 - **59** months	2	3.5%	2	3.8%	4
Total	56	100%	52	100%	108

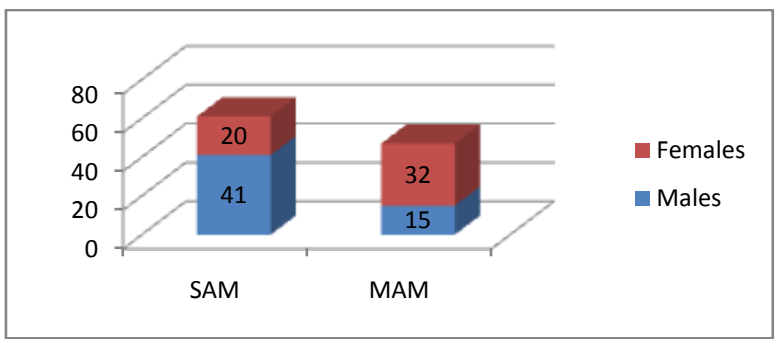

Fig No.1 Sex wise distribution of SAM and MAM children

Table No:2. Significance of Predisposing factors among Malnutrition children

Factor		Malnutrition	Number of children	Percentage	Total (n=108)	Percentage
Immunization	Yes	SAM MAM	50 42	54.3% 45.6%	92	85.1%
	No	SAM MAM	11 5	68.7% 31.2%	16	14.8%
Interval between two pregnancies	< 2 years	SAM MAM	13 6	68.4% 31.5%	19*	19%
	> 2 years	SAM MAM	43 38	53% 46.9%	81*	81%
Birth Weight	LBW	SAM MAM	14 8	63.6% 36.3%	22	20.3%
	NBW	SAM MAM	47 39	54.6% 45.3%	86	79.6%
Complications	With	SAM MAM	47 25	65.2% 34.7%	72	66.6%
	With out	SAM MAM	14 22	38.8% 61.1%	36	33.3%

* - n=100

Table No:3 Showing P value of predisposing factors

Predisposing Factor	Chi square	P value	Significance
Immunization	1.145	0.28	NSS
Interval between two pregnancies	1.458	0.22	NSS
Birth Weight	0.577	0.44	NSS
Complications	6.83	0.008	SS

NSS - Not Statistical Significant; SS - Statistical Significant

Table no:4. Assessment of Feeding habits among Malnutrition Children

Feeding habits		Total No. of cases (n=108)	No. of SAM cases	Percentage of SAM cases
First feeding	< 1 hour	63	36	57.1%
	> 1 hour - 12 hours	31	16	51.6%
	12 hours - 24 hours	14	9	64.2%
Exclusive breast feeding	< 4 months	16	10	62.5%
	Up to 6 months	50	28	56%
	>6 months	42	23	54.7%
Weaning	< 4 months	13	8	61.5%
	At 6 months	56	31	55.3%
	>6 months	39	22	56.4%
Frequency of feeds/day	< 6 times/ day	102	59	57.8%
	≥ 6 times/day	**5**	0	0
Mixed diet according to age	yes	81	48	59.2%
	no	**27**	**14**	**51.8%**

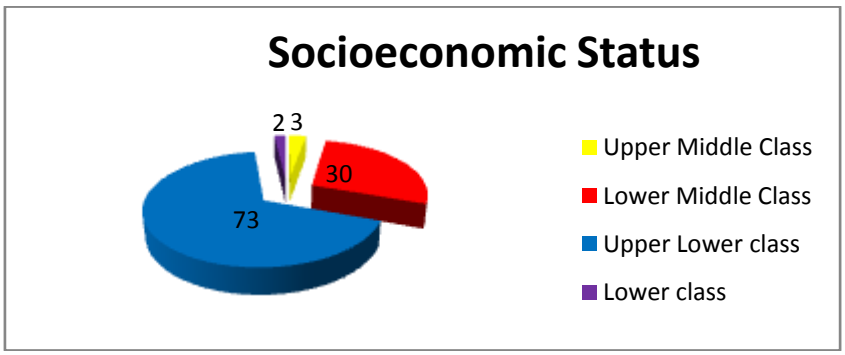

Fig No:2. Assessment of Socioeconomic status among Malnutrition children

VI. CONCLUSION

Malnutrition incidence can be decreased with simple measures by educating mothers about health care, hygiene measures, Feeding habits, immunization, seeking treatment at right time. Breast feeding habits, avoiding late initiation of breast feed after birth, weaning should start appropriately with balanced complementary diet according to the age can help to improve the nutritional status of the children, in turn aid in physical and mental development. Improving nutrition status of children and hygienic measures will definitely leads to decrease the medical complications.

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