STUDY OF NUTRITIONAL AND IMMUNIZATION STATUS IN CHILDREN 6 MONTHS TO 3 YEARS ATTENDING IMMUNIZATION CLINIC, UHTC, IGIMS, PATNA.

Community Medicine

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ABSTRACT

Background: In the first three years of life, good nutrition plays an important role in forming a good foundation that has impact on child's future physical and mental development. In this study we are focussing on the nutritional and immunization status in children 6months to 3 years attending immunization clinic,UHTC,IGIMS,PATNA with special emphasis to identify moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) cases.

Methods : It is an observational study carried out immunization clinic at UHTC,I.G.I.M.S. Patna included 400 cases age between 6 months to 3 years This study was conducted from January 2019 to June 2019 in immunization clinic UHTC, IGIMS Patna.

Results: Incidence of SAM and MAM is 7.5% and 30.75 % respectively. Female predominance was seen in SAM and MAM i.e. 53.4% and 54.6% respectively. Significant association of under-nutrition was found with LBW (p<0.05), not giving exclusive breast feeding up to 6 months of life (p<0.05) and, Low socioeconomic status (p<0.001). Higher numbers of females were unvaccinated.

Conclusions: Despite our great effort for improving maternal and child health, significant number of children are malnourished and unimmunized. So, for their better health we need to start from birth, institutional delivery, exclusive breast feeding, immunization, and timely introduction of complementary feeds, marriages at appropriate age, proper antenatal visits and birth spacing.

KEYWORDS

Breastfeeding, Immunization, Malnutrition

INTRODUCTION

Nutrition in the formative years of life plays a very important role in physical, mental, and emotional development of child and permits the highest state of fitness. Children differ from adults because their nutritional intake must provide not only for the replacement of tissues but also for growth.[1] Growth assessment best defines the health and nutritional status of children, because disturbances in health and nutrition, regardless of their etiology, invariably affect child growth and hence provide an indirect measurement of the quality of life of an entire population.[2]

Good nutrition, particularly in the first three years of life, is important in establishing and maintaining a good foundation that has implications on a child's future physical and mental health, academic achievement, and economic productivity. Infant mortality rate in India is 37.8 per 1000 live births and under-5 mortality rate is 37 per 1000 live births in 2018. Low birth weight, poor nutrition and lack of vaccination are important contributory factors for this.[3]

Severe acute malnutrition is defined by a very low weight for height (below -3z scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional oedema. Decreasing child mortality and improving maternal health depend heavily on reducing malnutrition, which is responsible, directly or indirectly, for 35% of deaths among children under five.

Moderate acute malnutrition (MAM), 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 11 cm and 12.5 cm.

The present study has been undertaken to study the "Impact of the nutritional and immunization services on the children between 6 months to 3 years," with special emphasis to identify MAM and SAM cases. An effort has also been made to identify factors responsible for malnutrition in the community.

METHODS

This observational study was done in 6 months to 3 years old children attending immunization clinic UHTC I.G.I.M.S Patna.. The study was conducted from January 2019 to June 2019 . A total of 400 children were studied using structured questionnaire which included information on socioeconomic and demographic data, antenatal health care practices, details of breast feeding and nutritional practices, education status and occupation of parents and knowledge and beliefs regarding nutrition of child from immediate care giver, which were usually the mothers. Immunization status was recorded based on immunization cards and verbal record from mothers.. Children with chronic disease were excluded from study.

Complete physical examination of every child was done with special emphasis on signs of nutritional deficiencies and anthropometric measurements were taken using standard technique and instruments. Criteria for defining SAM and MAM were used as per WHO guidelines.[4] Socioeconomic status was determined by using Modified Kuppuswamy scale (proposed updating for January 2017).[5] On qualitative data non-parametric Chi-square test was applied and p value <0.05 was considered significant. Chi- square was calculated by using EpiCalc and appropriate statistical software.

RESULTS

In table 1. majority of normal children lie The age and sex wise distribution of nutritional status of children in present study was as follows between 6 to 12 months of age i.e. 38.8% whereas 35.7% and 40.0% of MAM and SAM children respectively are between 13 to 24 months of age. However, this difference in age group was found to be non-significant. (p> 0.05). Female predominance was seen in SAM and MAM i.e. 53.4% and 54.6% respectively though 59.1% normal children were males Table 2 is showing relationship of birth weight with nutritional status of children. Birth weight was <2.5kg in majority of the children (37.5%). Higher number, 43.3% and 45.5% of SAM and MAM children had birth weight <2.5 kg. LBW was significantly associated with under nutrition (p<0.05). In present study mothers of 50.5% of all children practiced exclusive breast-feeding. Ninety percent of SAM children were not given exclusive breastfeeding. Not giving EBF up to 6 months was found to be significantly associated with malnourishment as shown in table 3.

<12months as compared to 36.8% and 42.2% of normal and MAM children respectively In present study we found majority of the children (59%) who practiced breast-feeding continued it for >12months.70% of the SAM children were breast fed for There was significant association between total duration of exclusive breast feeding and malnutrition (p <0.05) as shown in Figure1 In the present

study, all the children have been started on top feed. In majority of the children 55%, top feeding was started between 6-9 months of age.90% of SAM children were given top feed before the age of 6 months.

It was found to be statistically significant. (p<0.05). Higher number of SAM (56.7%) and MAM (57.7%) belongs to grade IV as compared to 18.6 % in normal. Also 20% SAM and 15.6% MAM belong to grade V as compared to 12.1% in normal.

Low socioeconomic status was found significantly associated with under nutrition. (p<0.001) as shown in figure 2. 68 % of total children were vaccinated for age, 27 % were partially vaccinated while 5 % were not vaccinated at all. Maximum number of fully immunized children belonged to age group 6-12 months. (p>0.05). 74 % of the males were fully immunized as compared to 60.8 % of females.

Higher number of females was unvaccinated. Difference in immunization was found to be statistically significant (p<0.05). This probably shows bias for male gender and better utilization of ICDS services by boys.

Table 1;Age and sex wise distribution of nutritional status.

Age (in months)	Norm al			SAM			MAM		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
6-12	57(23)	39(15.8)	96(38.4)	6(20.0)	5(16.6)	11(36.6)	18(14.6)	23(18.6)	41(33.3)
13-24	42(17.0)	33(13.3)	75(30.4)	5(16.6)	7(23.3)	12(40.0)	20(16.2)	24(19.5)	44(35.7)
25-36	47(19.0)	29(11.8)	76(30.8)	3(10.0)	4(13.3)	7(23.7)	18(14.6)	20(16.2)	38(30.8)
Total	146(59.1)	101(40.9)	247(100)	14(46.6)	16(53.4)	30(100)	56(45.4)	67(54.6)	123(100)

Table 2: Relationship of nutritional status with birth weight.

Birth weight	Normal (%)	SAM (%)	MAM (%)	Total (%)
< 2.5 kg	81 (32.7)	13 (43.3)	56 (45.5)	150 (37.5)
2.5 - 3.5 kg	98 (39.6)	5 (16.6)	32(26.0)	135 (33.7)
> 3.5 kg	31 (12.5)	1 (3.3)	12 (9.7)	44 (11.0)
Not known	37 (14.9)	11 (36.6)	23 (18.6)	71(17.7)
Total	247	30	123	400

Table 3: Relationship of nutritional status with exclusive breast feeding.

EBF	Normal	SAM	MAM	Total
Yes	130(52.6)			202(50.5)
No	117(47.4)	27(90)	5443.9)	198(49.5)
Total	247	30	123	400

Table 4: Relationship of nutritional status with initiation of top feeding

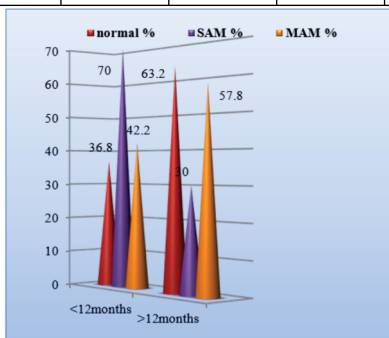| Top feeding started at age (months)	Normal	SAM	MAM	Total
<6				148 (37.0)
6-9				220 (55.0)
>9	9 (3.6)	0	23 (18.6)	32 (8.0)
Not started	0	0	0	0
Total	247	30	123	400

Figure 1: Relationship of nutritional status with duration of breast feeding.
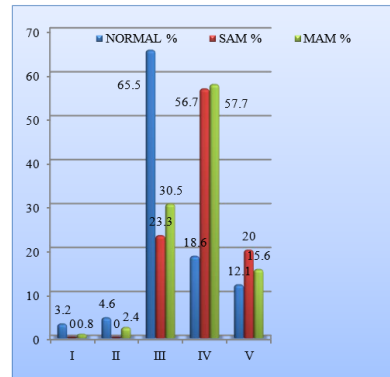

Figure 2: Awareness of disease caused by dog bite.

DISCUSSION

The present study included children between age group of 6-36 months as most cases of malnutrition are seen between age group 6 -24 months. Female predominance was seen in SAM and MAM i.e. 53.4% and 54.6% respectively though 59.1% Normal children were males. A similar study was done by Mittal A et al, found that severe grades (III and IV) were common in females.[6] Kumar A et al did a study in which sample included 585 children with equal gender representation (49% males and 51 % females).[7] Proportionally girls (46.2%) were more malnourished than boys (33.6%) similar to present study. S. Bose et al found that, the rate of underweight and wasting was higher among girls (underweight = 35.1%, wasting = 12.2%) compared with boys (underweight = 26.5%, wasting = 6.3%).[8]

In the present study, out of 400 children 247(61.7%) were normal 153 (38.3%) were malnourished. Among SAM, majority of children 12 (40%) were in the age group of 13-24 months, 11(37.3%) were in age group 6-12 months and rest 7(23.7%) were in age group 25-36 month. in MAM children, majority were between 85(69.2%) 6-24 months and rest 38 (30.8%) were between 25-36 months.

71 (17.7%) mothers had no idea about birth weight of the child as well as had no natal records. It was found that more number of MAM 56(45.5%) and SAM 13(43.3%) children had weight less than 2.5 kg at birth than normal children 81 (32.7%). Chi-square- 20.68 (p<0.05) (S). It showed low birth weight is associated with occurrence of malnutrition. In present study, observations on birth weight were taken as reported by mother or immediate caregiver of the child, and birth certificate. Similar findings were reported by Padma Mohan et al who found significant difference between mean birth weight of malnourished cases and normal children.[9]

In present study, 202(50.5%) practiced exclusive breastfeeding. Exclusive breast-feeding was practiced among less number of SAM, 3(10%) as compared to 69(56.1%) in MAM and 130(52.6%) in normal children. Even among those mothers who practiced EBF only 3.33% SAM, 15.4% MAM and 31.55% normal practiced EBF up to 6 months that is recommended. Significant association was found with lack of practice of exclusive breast-feeding and malnourished. Chi- square 21.68 (p<0.05) (S)Our findings were similar to Solomon et al who also reported that lack of exclusive breast feeding was more common in malnourished 49(48%) than in controls 24(23.5%).[10]

In the present study, 164 (41%) were given breast feed < 12 months while remaining 236 (59%) were given breast feed > 12 months Among children who were given breast feed < 12 months, higher number of SAM 21 (70%) as compared to 52 (42.2%) MAM and 91 (36.8%) normal were seen (p<0.05). These findings were consistent with the observation of Solomon et al who reported that breast-feeding was discontinued in less than 24 months in 61.8% of cases of SAM as compared to 18.8% of controls.[10] In the present study, majority of the children belong to lower middle (Class III of Kuppuswamy's scale).

Higher number of SAM 23(76.7%) and MAM 90(73.3%) belong to Class IV and V. Chi-square 83.6 (p<0.001) (S) Only 9 children belong to class I of socioeconomic status in present study. 8 (3.2%) in normal, 1.8% in MAM and there was no one in SAM who belonged to class I group. Solomon et al (2006) reported that monthly family income less than 50 USD was higher in cases (85.3%) than controls (62.7%).[10] Baitun et al also reported that poor monthly income (defined as<75

USD) more among cases 304 (75.7%) as compared to controls 186 (37.5%).[11] Our findings were consistent and comparable to above-mentioned studies but were contradictory to Saito et al who reported no significant association between household income and children's nutritional status.[12]

In present study it was found that out of 400 children, 272 (68%) were completely vaccinated for age, while 108 (27%) were partially vaccinated. Among SAM 11 (36.6%) and MAM 9 (7.2%) were not at all vaccinated. No significant association was found between unvaccinated state of child and undernutrition. Our finding was similar with study done in Pakistan by Waqar Azim et al who also reported that maximum number of children admitted with grade II and III were immunized against polio, diphtheria, pertussis, and tetanus.[13]

This probably indicated better utilization of vaccination services by the parents of undernourished children due to increased awareness by various efforts on the part of government of India. Our findings were contradictory to Baitun et al who reported that absence of BCG, DPT and measles were significantly associated with severe malnourishment.[11]

CONCLUSION
Despite our great effort for improving maternal and child health, significant number of children are malnourished and unimmunized. So, for their better health we need to start from birth, institutional delivery, exclusive breast feeding, immunization, and timely introduction of complementary feeds, marriages at appropriate age, proper antenatal visits and birth spacing.

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