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Research Article

Nutritional status of children in rural Telangana in relation to complementary feeding practices

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ABSTRACT

Background: Breast milk alone is not enough to meet the nutritional needs of the infant after 6 months of age and optimal complementary feeds should be added to the diet at this time while continuing the breast feeds. This transition from exclusive breastfeeding to family feeds i.e., complementary feeding covers the period from 6 to 18-23 months of age and is vulnerable for malnutrition to develop. Therefore this study aimed to identify the nutritional status of infants and young children (6 to 23 months) in relation to currently existing complementary feeding practices in rural Telangana.
Methods: It is a cross-sectional observational hospital based study carried out in Pediatric Department, Kamineni Institute of Medical College, Narketpally, Nalgonda district, Telangana from September 2015 to December 2015. Mothers who have children were included and anthropometry of children was taken and analysed.
Results: 44.6% were under weight, 37.7% were stunted, 20.78% were wasted in the current study. Under nutrition reached to the peak levels at 18-23 months of age. Low socio-economic status, mother's education, birth spacing of <2 years, prolonged exclusive breast feeding and less than recommended frequency of complementary feeds were risk factors for various forms of malnutrition.
Conclusions: Poor IYCF practices are associated with poor nutritional outcomes. The state of IYCF practices across India should improve to achieve the goals of global targets for 2025.

Keywords: Complementary feeding, Underweight, Stunting, Wasting

INTRODUCTION

Good nutrition is the most important aspect of human well-being. Before birth and throughout infancy good nutrition allows brain functioning to evolve without impairment and the immune system to develop more robustly.[1] Adequate provision of nutrients, beginning in early stages of life, is crucial to ensure good physical and mental development and long term health.[2] Evidence from 54 low and middle income countries indicates that growth faltering on average begins during pregnancy and continues to about 24 months of age. The loss in linear growth is not recovered and catch-up growth later on in childhood is minimal.[3] While the UNICEF conceptual frame work reflected a focus on children of pre-school age, there is now more emphasis on policies and programmes that support action before the age of 2 years, especially on maternal nutrition and health and appropriate infant and young child feeding (IYCF) and care practices.[3] Improvements in nutrition after age 2 do not usually lead to recovery of lost potential. A consequence that is also emerging more clearly is the impact of stunting and subsequent disproportionate and rapid weight gain later in life. These long term effects are referred to as the fetal programming concept. This rapid weight gain later in life raises the rate of coronary heart disease, stroke and type II diabetes.[3]

Breast milk alone is sufficient to meet the nutritional requirement up to 6 months of age. After 6 months of age

(180 days) it becomes increasingly difficult for breast fed infants to meet the nutrition needs from breast milk alone.[4] Complementary feeding (CF) after 6 months is extremely important due to high risk of micronutrient deficiencies and malnutrition.[4] Mothers are expected to make the "weaning bridge" or the bridge of complementary feeding to carry the children across the pit of malnutrition during liquid to solid transition.[5]

Our college is located in rural parts of Telengana where exclusive breast feeding is traditionally followed in majority of families As most of the children fall into the pit of malnutrition during the weaning and post weaning phase we have taken up the study to assess the nutritional status of infants and young children in relation to currently existing complementary feeding practices in this area.

METHODS

This cross-sectional observational study was conducted in Rural based medical college hospital, Telangana from September 2015 to December 2015. The study was approved by the Institutional ethics committee. 130 mothers with infants and young children of 6-23 months age who were attending to our well baby clinics during the study period and willing to participate were randomly included in the study. Children who were not accompanied by their mothers, who were born as preterm, or IUGR or low birth weight, and non-willing mothers were excluded from the study. Data was collected in the pre-structured questionnaire. Weight was recorded on electronic weighing scale with minimal clothing. The recumbent length was measured with the help of infantometer. Indicators based on weight, length and age were compared to WHO growth standards and classified as normal, underweight, stunting, and wasting.[6-12]

The collected data was analysed using statistical package SPSS software version-19. Chi-square test was carried to test the relation. P-value <0.05 was considered as significant.

RESULTS

135 mothers who had children in the age group of 6 months to 23 months were included initially. 5 children were excluded later as their mothers refused to continue. A total of 130 subjects were studied. The socio demographic profile of these subjects is shown in Table 1.

Out of the 130 children 76 (58.5%) were males and 54 (41.5%) were females. Mean age of participants was 14.8±8 months.

Table 1: Characteristics of neonates in the study.

Variable (n=130)	Frequency(%)
Age of the child	
6-8 months	21 (16.2%)
9-11 months	24 (18.5%)
12-17 months	49 (37.7%)
18-23 months	36 (27.7%)
Sex	
Males	76 (58.5%)
Females	54 (41.5%)
Mother's educational status	
Not educated	39 (30.0%)
Primary	16 (12.3%)
High School	44 (33.8%)
Inter & above	31 (23.8%)
Socio-economic status	
Class I (upper)	0
Class II (upper middle)	9 (6.9%)
Class III (Lower middle)	58 (44.6%)
Class IV (upper lower)	63 (48.5%)
Class V (lower)	0
Birth Order	
First child	65 (50.0%)
Second child	59 (45.4%)
Third child	6 (4.6%)
Birth Interval	
Less than 2 years	17 (13.1)
More than 2 years or first child	113 (86.9%)
Duration of EBF	
For 6 months	63 (48.5%)
< than 6 months	12 (9.2%)
> than 6 months	55 (42.3%)
Quality	
Home made	83 (63.8%)
Commercial	40 (30.8%)
Not started	7 (5.4%)
Frequency	
As recommended	30 (23.1%)
Less than recommended	100 (76.9%)
Weight	
Normal	72 (55.4%)
Under weight	58 (44.61%)
Length	
Normal	81 (62.3%)
Stunted	49 (37.7%)
Weight for length	
Normal	103 (79.2%)
Wasted	27 (20.78%)

Weight for age (WAZ)

In 130 children 72 (55.38%) were of normal weight and 58 children (44.61%) were under weight, in which 18 (13.85%) were severely underweight. Under-nutrition is significantly co-related to the age of children. p<0.05 (0.004). There was peak level of under-nutrition at 18-23 months of age

Table 2: Severity of under nutrition age wise.

Age of children	Children with normal weight (%)	Under-weight (%)	Severely underweight (%)
6-11 months (n-45)	33 (73.33%)	9 (20%)	3 (6.67%)
12-17 months (n-49)	27 (55.10%)	15 (30.61%)	7 (14.28%)
18-23 months (n-36)	12 (33.33%)	16 (44.44%)	8 (22.22 %)

Out of 72 children who were normally nourished 39 (54.2%) were males and 33 (45.8%) were females. In 58 under nourished children 37 (63.8%) were males and 21 (36.2%) were females. 48.7% of males and 38.9% of females were under nourished. Although sex was not statistically significant p>0.05 (0.268) percentage of males exceeded that of females in under- nourishment.

Mother's educational status did not show impact on WAZ with p>0.05 (0.204). However, socio-economic status was an increased risk factor for under-nutrition p<0.05 (0.003). Current study revealed 63.8% of under nourished children in upper lower group (class IV) followed by 34.5% in lower middle (class III) and only 1.7 % in upper middle (class II). We did not have subjects from upper (class I) or in lower (class V) economic groups.

Birth order did not show effect on nutrition p>0.05 (0.774) but birth spacing showed a trend with p value of 0.074 although statistically not significant. Children with birth spacing of <2 years were more affected than subjects with birth interval of >2 years or first child. However, current study had only 13.07% subjects with birth interval <2 years which is very encouraging in terms of spacing of children. Others 113 (86.92%) were either first child or with interval of >2 years.

Duration of exclusive breastfeeding (EBF) was significantly increased the risk of under nutrition with p<0.05 (0.007). 58.4% of subjects who received prolonged EBF were under nourished compared to 39.34% in children with EBF for 6 months. Surprisingly only 14.3% of children who received EBF for less than 6 months were affected.

Time of initiation of complementary feeding (CF) showed statistically significant results with p <0.05 (0.043). In the current study 63 (48.46%) subjects were started CF at the recommended age i.e., at 6 months (180 days). 37 (58.7%) subjects of this group maintained the normal weight and 26 (41.3%) were under nourished.55 subjects were initiated feeds after 6 months. Here 25 (45.5%) were within normal limits 30 (54.5%) were under nourished. Again, 12 (9.23%) children who received early feeds were less affected. Here 10 (83.3%) subjects were of normal weight and only 2 (16.7%) were under weight. Quality and frequency of complementary feeds did not show any statistically significant results to WAZ (p>0.05).

Length for age (LAZ)

81 (62.3%) subjects out of 130 were of normal length for age and 49 (37.69%) were stunted of which 21 (42.86%) were severely stunted. Age was statistically highly significant P<0.05 (0.000). Stunting also showed peak trend with age i.e., more subjects were affected at 18-23months of age which is similar to underweight Table 3. 41.7 % of Children in later part of second year were stunted compared to 2.22% in later part of first year. 40.1% of males 31.5% of females were stunted although males exceeded females sex did not show co-relation to stunting p>0.05 (0.218) and is similar to underweight.

Table 3: Severity of stunting age wise.

Age in months	Normal LAZ	Stunted	Severely stunted
6-11 months (n=45)	37 (82.2%)	7 (15.55%)	1 (2.22%)
12-17 months (n-49)	31 (63.3%)	13 (26.5%)	5 (10.2%)
18-23 months (n-36)	13 (36.1%)	8 (22.2%)	15 (41.7%)

Mother's educational status and socio-economic status significantly increased the risk of stunting with p value <0.05 (0.023 and 0.000 respectively). 73.5% of stunted children were in upper lower (class IV), 24.5% were in lower middle (class III) and only 2% were in upper middle (class II). Birth order did not affect the nutritional status with p>0.05 (0.600) but birth spacing showed significant co-relation p<0.05 (0.014). 64.7% of children with birth interval of <2 years were affected compared to 33.6% of children with interval of more than 2 years or first child.

Prolonged EBF significantly increased the risk p<0.05 (0.02). 53.1% of subjects who received prolonged EBF were stunted in contrast to 14.9% with EBF for 6 months. This confirms that prolonged EBF without complementary feeds have adverse effects.

Time of initiation of complementary feeding did not show any relation to length p >0.05 whereas frequency of feeds was highly significant p<0.05 (0.007). 16.7% of children receiving recommended frequency of feeds were stunted unlike their counterparts with lesser frequency where 44% were stunted.

Weight for length

Was not associated with age, socio-economic status, or

birth order with p-values >0.05 (0.334, 0.193 and 0.102). Sex and mother's educational status showed a trend with p values nearer to 0.05 (0.064 and 0.061 respectively). Males (26.3%) exceeded females (13%) in wasting. Higher education of mother resulted in low (6.5%) percentage of wasting. Birth spacing resulted in better outcome p<0.05 (0.004) whereas birth order did not p>0.05. 47% of subjects with interval of less than 2 years were wasted and only 16.8% of with interval of >2 years were affected. Duration of EBF and frequency were not related p>0.05. But time of starting of complimentary feeds and quality showed a trend with p values of 0.064 and 0.065 respectively.

DISCUSSION

Although malnutrition is multi-factorial, socio-demographic and complementary feeding practices play a major role in its etiology.

In the current study 46.9% of children received EBF for 6 months. According to NFHS-4 Telangana rural it is 66.8%.[13] This is not consistent with this report. It could be due to small sample size and hospital based back ground. 48.5% of our subjects were given complimentary feeds at recommended age and is much lower to NFHS-4, Telangana report of 56.4%. And might be resulted due to similar factors. But in Anju Aggarwal, et al study it was 17.5%.[14]

The proportion of underweight, stunting, and wasting in children of 6-23 months was 44.6%, 37.7%, 20.76% respectively in the present study. This is almost similar to the observation made by Dewesh, et al from urban Delhi where it was 40.8%, 37.9%, 22.3%.[15] But in NFHS-4 Telangana reported much lower proportions of underweight 33.1 %, stunting 33.3%, and wasting 20.4 % among under-fives.[13] Inclusion of all under five children in this report might cause the difference. Current study results for wasting (20.76%) were consistent with NFHS-4, Telangana report of 20.4%. Severe wasting in the current study was 6.9% similar to NFHS-4 Telangana facts of 5.6%. In a community based Ethiopian study the proportions of underweight, stunting, wasting were 19.5%, 20.9%, and 17.5% respectively and is much less than the current study.[16] This could be due to small sample size and rural back ground. In a study done by Dinesh Kumar, et al the proportions of under-weight, stunting, and wasting were 36.4%, 51.6%, 10.6% respectively.[17] They observed 51.6% of stunting and in the current study it was 37.7% which is encouraging. There were peak levels of malnutrition in 18-23 months of age in the current study. It is consistent with the studies of Diwesh Kumar, et al from urban Delhi.[15] And Dinesh Kumar, et al from Chandigarh.[17] Other studies also reported similar observation.[18,19] The NFHS 3 data confirms that mother's education has a direct impact on nutritional status of children.[20] In the current study WAZ is not co-related to mother's education p>0.05 (0.204). But LAZ is significantly co-related p<0.05 (0.023) and weight for length showed a trend (p-0.061). This is similar to Ethiopian study.[16] This confirms not only education, but knowledge of CF is important. Socio-economic status showed high impact on nutrition in our study. This supports the observation of Diwesh Kumar study and report of children in India 2012.[15,20]

Birth spacing played important role in nutrition and is comparable to the study of Diwesh Kumar.[15] Encouraging birth spacing for >2 years may decrease malnutrition. Prolonged EBF, late initiation of complementary feeds and less than recommended frequency resulted in different forms of under nutrition.

CONCLUSION

Poor IYCF practices are associated with poor nutritional outcomes. In the current study proportions of underweight and stunting are more in 18-23 months of age indicating the vulnerable age for malnutrition. This is due to poor weaning practices from 6 months to 18 months. Poor weaning practices included not only late initiation of CF but also the quality and more importantly the frequency of feeds. The state of IYCF practices across India should improve to achieve the goals of global targets for 2025 i.e., 40% reduction in stunting of under-5, <5% reduction in wasting. As stated in The Healthy Growth Project households and communities should participate as the main protagonists of healthy child growth and development. Care givers need to be sensitized to the causes and consequences of stunting and made aware that their actions are critical because they directly impact how children grow and develop.

Limitations of the study were the design of the study is cross-sectional which could not establish a cause and effect relation between different variables. As is it is a hospital based study it may not represent the entire rural population.

Strengths of the study were inclusion of infants and Young children only as this is the most vulnerable age instead of whole under-fives.

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