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Complementary feeding practices of children (6 months-23 months) in and around Lucknow, India

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ABSTRACT

Background: According to infant and child mortality in India, levels trends and determinants the under 5 mortality rates (UFMR) of India is facing a steady decline but at this rate India could not meet its target of millennium development goal-4 (MDG-4), which aimed to reduced UFMR by 2/3rds between 1990 and 2015. Objective of the current study was to study the complementary feeding practices amongst children of age group 6 months to 23 months in Lucknow.

Methods: In this prospective cross sectional study 256 mothers were interviewed over a period of 6 months at a referral care centre in Lucknow. Children of age groups 6-8 months, 9-11 months and 12-23 months attending the Paediatric OPD were included in the study. WHO anthropometric indices of nutritional status: weight-for-age, length-for-age and weight-for-length, expressed in standard deviation (SD) units (z-scores) were calculated. Information on feeding practices and various particulars of the study children were taken into account and the WHO Indicators for assessing infant and young child feeding practices were calculated. Complementary feeding index CFI was calculated using these WHO indicators.

Results: In the study group 24% of the children were stunted, 38% were underweight and 35% were wasted. The CFI was seen to be low in 32%, medium in 61% and high only in 7% children. It was found that parental education had significant correlation with CFI. Weight for height was significantly associated with CFI (p=0.011).

Conclusions: CFI is an important tool to target the lacunae in complementary feeding practices. The CFI scores directly correlate with the nutrition status of children thus targeting the determinants of CFI will bring a positive change in infant and young child feeding practices.

Keywords: Complementary feeding, Complementary feeding index, Complementary feeding practices

INTRODUCTION

According to infant and child mortality in india, levels trends and determinants the under 5 mortality rates (UFMR) of India is facing a steady decline but at this rate India could not meet its target of millennium development goal-4 (MDG-4), which aimed to reduced UFMR by 2/3rds between 1990 and 2015. Infant feeding practices, malnutrition and childhood mortalities are interlinked together.

Complementary feeding is the transition from exclusive breastfeeding to family foods and covers the period from 6 - 24 months of age.¹

The adequacy of complementary feeding is judged by its timing of initiation, safety and its appropriateness. An important fact is that Incidence of malnutrition rises during 6-8 months of age which indicates the importance of appropriate complementary feeding.^{2,3}

Objective quantification in the form of complementary feeding indices using WHO Indicators for assessing infant and young child feeding practices will enhance our efforts to focus on the various lacunae. WHO previously used the indicator 'Timely complementary feeding rate' which was a combination of 2 practices, i.e. continued breastfeeding and consumption of solid, semi-solid or soft foods, so it could not differentiate which out of the two was lacking, later on it was divided into 3 different set of indicators 'Introduction of solid, semi-solid or soft foods' and 'Continued breastfeeding at 1 year' and 'Continued breastfeeding at 2 years'.⁴

This cross-sectional prospective study conducted in Lucknow, was undertaken to assess the adequacy of complementary feeding (CF) practices and determine its association with growth of children, aged 6-23 months of age.

METHODS

This was a hospital based cross-sectional prospective study done over a period of 6 months at a referral care centre in Lucknow, India. Children of age groups 6-8 months, 9-11 months and 12-23 months attending the Paediatric OPD were included in the study. A written informed consent was taken and pre-designed proformas along with standard dietary recall forms were filled up.

Detailed anthropometry was done and data on weight and length were used for calculating the following three summary indices of nutritional status: weight-for-age, length-for-age and weight-for-length, expressed in standard deviation (SD) units (z-scores) as per the child growth standards of WHO.⁵

Table 1: WHO Indicators for assessing infant and young child feeding practices.

Continued breastfeeding at one year:	Children ever breastfed:		
Proportion of children 12-15 months of age who are fed breast	Proportion of children born in the last 24 months who		
milk.	were ever breastfed.		
Introduction of solid, semi-solid or soft foods	Continued breastfeeding at two years		
Proportion of infants 6-8 months of age who receive solid,	Proportion of children 20-23 months of age who are		
semi-solid or soft foods.	fed breast milk.		
Minimum dietary diversity	Age-appropriate breastfeeding		
Proportion of children 6-23 months of age who	Proportion of children 0-23 months of age who are		
receive foods from four or more out of seven food groups.	appropriately breastfed.		
Minimum meal frequency	Bottle feeding		
Proportion of breastfed and non-breastfed children 6-23			
months of age who receive solid, semi-solid or soft foods	Proportion of children 0-23 months of age who are		
(including milk feeds for non- breastfed children) the	fed with a bottle.		
minimum number of times or more.			
Minimum acceptable diet	Milk feeding frequency for non-breastfed children		
Proportion of children 6-23 months of age who	Proportion of non-breastfed children 6-23 months of		
receive a minimum acceptable diet (apart from breast milk).	age who receive at least two milk feedings (infant		
receive a minimum acceptable thet (apart from bleast milk).	formula, cow's milk or another animal milk).		

Information on feeding practices and various particulars of the study children were taken into account and the WHO Indicators for assessing infant and young child feeding practices were calculated (Table 1).⁶

The practices have been considered positive or negative based on the complementary feeding guidelines of the World Health Organization (WHO) for breastfed children.⁷ The scoring of the complementary feeding index CFI was done by assigning a score of '0' for a harmful practice and a score of '2' for a positive practice. Those practices in between these two were given a score of '1'. Complementary feeding index CFI was calculated using these WHO indicators.^{8,9} CFI score were assigned to three categories of Complementary feeding practices: low, medium, and high.

RESULTS

Socio demographic profile

As shown in Table 2, total 256 mothers of children (6-23 Months) were interviewed. 139 were (54.30%) boys. Out of 256 children 93 children were between 6-11 months, 81 children were between 12-17 months and 82 children were between 18-23 months. The majority (65%) belonged to joint families, with 27%, 45%, and 27% of the infants belonging to low, medium, and high socioeconomic status respectively as per the Standard of living indices (SLI) score. Only 10% of the mothers in the sample reported being engaged in any formal occupation. The large majority (67%) of the mothers were literate.

Nutritional status analysis

In the sample, 24% of the children were stunted (length for age LAZ <-2SD), 38% were underweight (weight for

age WAZ<-2SD) and 35% were wasted (weight for length WLZ<-2SD).

Table 2: Socio-demographic data.

	6-11 months	12-17 months	18-23 months	Total
Female	42/93 (45.2%)	30/81 (37.0%)	45/82 (54.9%)	117/256 (45.7%)
Male	51/93 (54.8%)	51/81 (63.0%)	37/82 (45.1%)	139/256 (54.3%)
Mother's education				
<10 th	45/93 (48.4%)	31/81 (38.3%)	33/82 (40.2%)	109/256 (42.6%)
10 th pass	16/93 (17.2%)	12/81 (14.8%)	14/82 (17.1%)	43/256 (16.8%)
12 th pass	16/93 (17.2%)	9/81 (11.1%)	6/82 (7.3%)	31/256 (12.1%)
Graduate	11/93 (11.8%)	22/81 (27.2%)	23/82 (28.0%)	55/256 (21.5%)
Post graduate	5/93 (5.38%)	7/81 (8.64%)	6/82 (7.3%)	18/256 (7.0%)
Mothers' occupation				
Working	15/93 (16.1%)	5/81 (6.2%)	5/82 (6.1%)	25/256 (9.8%)
Not working	78/93 (83.9%)	76/81 (93.8%)	77/82 (93.9%)	231/256 (90.2%)
Type of family				
Nuclear	28/93 (30.1%)	31/81 (38.3%)	30/82 (36.6%)	89/256 (34.8%)
Joint	65/93 (69.9%)	50/81 (61.7%)	52/82 (63.4%)	167/256 (65.2%)
SLI				
Low	25/93 (26.9%)	21/81 (25.9%)	24/82 (29.3%)	70/256(27.3%)
Medium	42/93 (45.2%)	36/81 (44.4%)	38/82 (46.3%)	116/256 (45.3%)
high	26/93 (28.0%)	24/81 (29.6%)	20/82 (24.4%)	70/256 (27.3%)

Complementary feeding practices

As depicted in Table 3, majority of children (95%) were ever breast fed but continued breast feeding at 1 and 2 years were seen in 76% and 67% respectively. 21% were bottle fed across all groups. Age appropriate breast feeding was being practiced in 62% of all children and on subgroup analysis it was seen that this was more in the younger age group of 6-11 months.

Adequate milk feed frequency for non-breast-fed children was noted in 95% children. It was 100% in age group 18 -24 months. It was seen that in 69% of children had timely initiation of complementary feeding.

The minimum meal frequency in both breast fed, and non-breastfed children was 60% and 69% respectively and minimum dietary diversity was 60% across all age groups.

CFI score and its determinants

The CFI was seen to be low in 32%, medium in 61% and high only in 7% children. In the group in which complementary feeding was just started i.e. in the age group of (6 months to 11 months) the CFI score was low only in 11% but in the 18-23-month group it was low in 57%. On univariate regression analysis it was found that

both mother and father education had significant correlation with CFI (p<0.05).

The gender of the child, working status of mother, number of children in family, type of family whether nuclear or joint was not found to be significantly associated with the CFI scores.

Amongst the three WHO parameters for assessing the nutritional status, WZH was significantly associated with CFI (p=0.011).

DISCUSSION

This study provides data on various qualitative and semiquantitative aspects of Complementary feeding in Lucknow, India by using a Complementary feeding index. CFI provides an objectivity to the complementary feeding practices being done, thus highlighting the areas which need improvisation.

The prevalence of stunting 24%, wasting 35% and underweight children 38% is comparable with the National Family Health Survey -4 data.

A significant association was found between the CFI scores and the weight for height of the children (p=0.011).

Ruel et al emphasized on strong and significant associations between child-feeding practices and height-for-age of the child, especially after 12 months of age, which they attributed to 'clustering of positive practices amongst older infants' that become apparent only after 12

months of age and increase over time. 8 Few other studies have also shown that CFI has significant association with length for age. 9,11

Table 3: Feeding practices as per CFI in the sample: percentage of mothers reporting selected practices, by agegroup of infants.

	6mnths-11 months	12 -17 months	18-23 months	Total				
CFI								
Low	10/93 (10.75%)	24/81 (29.63%)	47/82 (57.32%)	81/256=31.64%				
Medium	64/93 (68.82%)	57/81 (70.37%)	35/82 (42.68%)	156/256=60.94%				
High	19/93 (20.43%)	00/81 (00%)	00/82 (00%)	19/256=7.42%				
Children ever breastfed								
Yes	89/93 (95.70%)	78/81 (96.30%)	77/82 (93.90%)	244/256=95.31%				
No	4/93 (4.30%)	3/81 (3.70%)	5/82 (6.10%)	12/256=4.69%				
Continued breast feeding at 1 year								
Yes	Not applicable	52/68 (76.47%)	Not applicable	52/68=76.47%				
No		16/68 (23.53%)		16/68=23.53%				
Continued breast feeding a								
Yes	Not applicable	Not applicable	12/18 (66.67%)	12/18=66.67%				
No			06/18 (33.33%)	06/18=33.33%				
Bottle fed								
Yes	22/93 (23.65%)	20/81 (24.69%)	12/82 (14.63%)	54/256=21.09%				
No	71/93 (76.34%)	61/81 (75.31%)	70/82 (85.37%)	202/256=78.90%				
Age appropriate breast feeding								
Yes	67/93 (72.04%)	45/81 (55.56%)	47/82 (57.32%)	159/256=62.11%				
No	26/93 (27.96%)	36/81 (44.44%)	35/82 (42.68%)	97/256=37.89%				
Milk feeding frequency of 1	non-breastfed infants							
Yes	24/27 (88.89%)	34/36 (94.44%)	35/35(100%)	93/98=94.90%				
No	3/27 (11.11%)	2/36 (5.56%)	0/35	5/98=5.10%				
Introduction of complementary feeds								
Yes	24/35 (68.57%)	Not applicable	Na4 annl: aalala	24/35=68.57%				
No	11/35 (31.43%)	Not applicable	Not applicable	11/35=31.43%				
Minimum meal frequency								
Breast fed children								
Yes	35/70 (50.00%)	28/43 (65.12%)	32/45 (71.11%)	95/158=60.13%				
No	35/70 (50.0%)	15/43 (34.88%)	13/45 (28.89%)	63/158=39.87%				
Non breast fed children								
Yes	12/23 (52.17%)	31/38 (81.58%)	25/37 (67.57%)	68/98=69.39%				
No	11/23 (47.83%)	7/38 (18.42%)	12/37 (32.43%)	30/98=30.61%				
Minimum dietary diversity								
Yes	43/93 (46.23%)	60/81 (74.07%)	50/82 (60.98%)	153/256=59.77%				
No	50/93 (53.76%)	21/81 (25.93%)	32/82 (39.02%)	103/256=40.23%				
Minimum acceptable diet								
Breast fed children								
Yes	22/70 (31.43%)	24/43 (55.81%)	22/45 (48.89%)	68/158=43.04%				
No	48/70 (68.57%)	19/43 (44.19%)	23/45 (51.11%)	90/158=56.96%				
Non breast fed children								
Yes	9/23 (39.13%)	26/38 (68.42%)	25/37 (67.57%)	60/98=61.22%				
N0	14/23 (60.87%)	12/38 (31.58%)	12/37 (32.43%)	38/98=38.78%				

Significant associations were observed between the parental education and the complementary feeding index.

According to a study done in Sudan, low parental education led to the prevalence of nutritional anemia and

malnutrition.¹² In this study the CFI score was low in 11% of 6-11 months age but in the 18-23-month group it was low in 57%. Thus, showing that when the complementary feeding is initiated it is of appropriate quality but gradually its adequacy is deteriorated. Contrary to this finding a study revealed that the mean CFI scores were lower for 6-8 months as compared to 9-12 months age-group.⁹

In the study 60% and 69% of breast fed and non-breast-fed children were receiving the recommended frequency of complementary foods and minimum dietary diversity was seen in 61% children. The dietary diversity was lowest in the youngest (6-11 months) age group, then it improved but gradually again it fell from 74% to 61% in the older (18-23 months) age group. The low dietary diversity scores in both the age groups suggest that food items from only 1-2 food groups were being fed to the infants initially at 6-12 months and also later on 18-23 months, thus indicating the monotony and lack of variety in their diets. It has been reported that diversity in the diet of child was significantly associated with the nutritional status, especially height-for-age index in sub-Saharan children.¹³

CONCLUSION

To conclude CFI in our children was affected by parental education and a lower CFI led to wasting in them. Hence we suggest use of CFI or similar indices to identify the deficiency in complementary feeding practices at regional levels which can then be targeted by suitable modifications in nutritional programs.

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Institutional Ethics Committee

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