“PATTERN AND DETERMINANTS OF COMPLEMENTARY FEEDING PRACTICES AMONG 6-24 MONTHS CHILDREN OF RURAL INDIA”

Pediatrics

Dr. Nikki Kumari Senior Resident, Deptt of Pediatrics, N.M.CH, Patna.

Dr Khodaija Mahvish* Senior Resident, Deptt of Pediatrics, N.M.CH, Patna. *Corresponding Author

Dr Binod Kr Singh Professor & HOD, Deptt of Pediatrics, N.M.C.H, Patna.

ABSTRACT

Background and objectives: Complementary feeding (CF) means introducing other foods when breast milk alone is not enough to meet the nutritional requirements of infants. WHO recommends starting complementary feeding after 6 months of age while continuing breast feeding up to 2 years of age for continued benefits. WHO also emphasizes on diet diversity to ensure a heterogeneous nutrient intake that provides all nutrients needed by the growing infant. In context of rural India, in-depth studies of complementary feeding practices are limited, revealing a clear knowledge gap. The present study was undertaken to assess the complementary feeding practices and factors influencing them among mothers of 6-24 months children. **Methodology:** This hospital based descriptive cross-sectional study was conducted over 2 years from April 2018-March 2020 including children aged >6 months and <24 months belonging to rural area visiting OPD or admitted in I.P.D of our hospital. Data was collected by direct interviewing of mothers regarding various aspects of breastfeeding and complementary feeding. **Results:** Over the study period, we enrolled 226 children in our study. Mean age was 9.7 months (SD 3.4months). Male: female ratio was 1.3:1. Mean age of mothers was 24.1 ± 4.2 years. Breastfeeding was initiated within 1 hour of birth in only 118(52.2%) babies. Complementary feeds were started at the end of 6 months in dismally low 21.2% children. It was started between 6-9 months in 38.5%, 9-12 months in 25.7% and after 12 months in 7.5% children. Proportion of infants getting minimal meal frequency was 59.3%, minimum dietary diversity only 45.6% and minimum acceptable diet only 47.8%. The most commonly used complementary food was milk and milk & cereal based preparations (61.5%). There was a statistically significant positive association between socioeconomic class and correct time of initiating CF as well as maternal education and minimum acceptable diet ($p < 0.01$). However, a significant negative association was found between working mother and proper consistency of feeds ($p < 0.01$). **Conclusion:** Our findings clearly indicate that lot more needs to be done for rural children. Whenever there is opportunity for health care workers, mothers should be educated about proper complementary feeding practices.

KEYWORDS

Complementary Feeding, Exclusive Breastfeeding, Infant Feeding, Nutrition

1. INTRODUCTION:

Proper nutrition during infancy and early childhood is crucial for every child's growth and development. First two years of life is critical for laying down foundation stone for optimal growth, health and behavioral development in later life¹. Complementary feeding means introducing other foods when breast milk alone is not enough to meet the nutritional requirements of the infants.² In a simpler way, this is the period of evolution from breast milk to solid foods as the principal source of nutrition

WHO recommends starting complementary feeding after 6 months of age while continuing breast feeding up to 2 years of age for continued benefit. In addition to timely introduction, WHO also emphasizes on diet diversity, that means choosing a variety of basic food groups in the diet to ensure a heterogeneous nutrient intake that provides all nutrients needed by the growing infant.³ Malnutrition is a significant contributor to under-5 mortality as well as morbidity⁴ and this is often associated with improper feeding practices. It is now believed that first 1000 days of life (starting from conception to the first 2 years of life) provide a critical window of opportunity for addressing undernutrition and underlying issues of low birth weight, sub-optimum feeding and infections. After the age of two years, this window gets closed and this golden opportunity is lost. For effective utilization of this 'Window of Opportunity' it is recommended to practice optimum Infant and Young Child Feeding Practices (IYCF)⁵. To provide the best chances of survival and optimal growth, Government of India, WHO (World Health organization), UNICEF (United Nations Children's Fund), USAID (United States Agency for International Development) have recommended early initiation of breastfeeding, exclusive breastfeeding for first 6 months and nutritionally adequate and safe foods after 6 months up to 2 years of age and beyond.⁶

Considering the impact of early nutrition practices on later life, proper knowledge of factors governing the same is needed so as to address the loopholes. However, whereas there has been good research on breastfeeding practices, in-depth studies of CF practices are limited, revealing a clear knowledge gap. Most of the Indian studies have focused on urban/semi urban areas and there is paucity of data about the same from rural areas. We this background, this study was undertaken to assess the complementary feeding practices and factors influencing them among mothers of 6-24 months children.

2. AIM AND OBJECTIVES:

Aim: To study the pattern of complementary feeding and determinants of the same.

Objective: 1. To study the time of initiation and profile of diet used for complementary feeding.
2. To study the various factors influencing complementary feeding

3. METHODOLOGY:

Study setting: Pediatrics O.P.D and I.P.D of deptt of Pediatrics, NMCH Patna.

Study duration: April 2018- March 2020 (2 Years).

Study design: Hospital based descriptive cross-sectional study.

Inclusion criteria: Children aged >6 months and <24 months belonging to rural area visiting OPD or admitted in I.P.D of our hospital.

Exclusion criteria: Children with congenital defects like cleft lip/ cleft palate and infants suffering from chronic systemic diseases (cardiac, hepatic, renal or neurological) were excluded from the study as their clinical or feeding practices could influence the parameters studied in the present study. Sick children requiring immediate admission and children not accompanied by parents or reliable caregivers were also excluded from the study.

Data collection: After obtaining informed consent for the study, children fulfilling the above mentioned criteria were enrolled in our study. At the time of admission, information regarding demographics, socio-economic factors and maternal factors in relation to infant feeding was collected and entered in a structured proforma. Previous day 24-hour recall method was used to collect information about dietary history. We also collected data about food groups, meal frequency and consistency. We evaluated our findings related to CF practices using indicators from the UNICEF Programming Guide on IYCF.

Statistical analysis: Data so collected was entered in Microsoft excel

and analyzed by SPSS version 20 software. Continuous variables were expressed as mean and SD (if normally distributed) or as median and interquartile range (if non-normally distributed). Categorical data was expressed as proportions or percentage. Student's t-test or Chi-square test was used for testing significance of difference as applicable. $P < 0.05$ was considered statistically significant.

4. Observation and results

Over the study period, we enrolled 226 children in the present study. Mean age was 9.7 months (SD 3.4months). Male (n=128) to female (n=98) ratio was 1.3:1. Mean weight of the group was 7.6kg (SD 1.9kg). 126 (55.75%) of the children were of first birth order while 13% children were of third or higher birth order. 129 (57.1%) of our study population children belonged to nuclear family. Mean age of the mothers was 24.1 ± 4.2 years. Most of the mothers (68.7%) had given childbirth by vaginal route. It was good to see that 78% of deliveries occurred in a hospital, and only 22% deliveries occurred at home. Most (n=205, 90.7%) of the mothers were housewives and only 9.3% were employed. Socio-economic status of the mothers was classified using Modified B.G Prasad scale. 78.8% belonged to lower strata (lower middle, middle class) and only 21.2% belonged to higher strata (middle and upper class). Table 1 shows status of mothers according to the three determining variables namely literacy, occupation, and socioeconomic status.

Table 1: Sociodemographic status of mothers:

Sociodemographic variables	Category	Number	Percentage
Education	Illiterate	19	8.4%
	Below Matriculation	99	43.8%
	Secondary pass	48	21.2%
	Higher secondary pass	33	14.6%
	Graduate or above	27	11.9%
Occupation	Employed	21	9.3%
	Unemployed	205	90.7%
Socioeconomic status	I, II, III	178	78.8%
	IV, V	48	21.2%

Breastfeeding practices: Breastfeeding was initiated within 1 hour of birth in only 118(52.2%) babies, delayed in 42.5% while 12 (5.3%) babies were never breastfed. 65(28.8%) children were bottle-fed alongwith breast feeding during the first 6 months of life. When asked about their thoughts about first milk or colostrum feeding, 41(27.71%) mothers denied having given colostrums to their babies due to a false belief that it is bad or stale milk.

Complementary feeding practices: Of the 226 cases studied, complementary feeds were started at the end of 6 months in only 21.2% children. It was started between 6-9 months in 38.5%, 9-12 months in 25.7% and after 12 months in 7.5% children. In 7.1% children, it was started before 6 months. The most common reason for early initiation of CF (Table 2) was mother's perception that their baby's hunger was not satisfied by breastmilk alone. Whereas, the most common reason for delayed initiation of CF was their perception that the baby didn't simply want to eat solid/semisolid foods: "the infant vomits or gags on taking feeds".

Table 2: Reasons for early or delayed commencement of complementary feeding:

Reason for initiation of CF	Frequency	% of cases
EARLY (n=16)		
Breast milk not sufficient	7	3.1
Hunger not satisfied	9	4.0
Working mother	2	0.9
Family pressure	3	1.3
LATE(n=162)		
Breast milk sufficient for the baby	32	14.2
Not accepting CF (baby doesn't want to eat)	122	54.0
Cost effective	8	3.5
CF Started at appropriate time	48	21.2%

Status of core IYCF indicators: Proportion of infants getting minimal meal frequency was 59.3%, minimum dietary diversity was only 45.6% and minimum acceptable diet only 47.8%. This indicates

lack of proper knowledge among mothers regarding complementary feeding. 81.2% of mothers from upper middle and upper class versus 38.7% of mothers from lower, lower middle and middle class initiated CF at 6 months ($p < 0.001$). No significant difference was found between birth order or male gender and timing of initiation of CF. Only 38.1% infants of working mothers received right consistency food while 65% housewives gave right consistency foods to their infants ($p = 0.01$). There was also a statistically significant association between maternal education and minimum acceptable diet. (71.7% in higher secondary and above versus 40.3% in matriculation and below, $p < 0.001$). The most commonly used complementary food was milk and milk and cereal based preparations (61.5%). Percentage of infants given only milk as complementary food was 24.3%.

Table 3: Core IYCF indicators:

IYCF indicator	Number	Percentage
Early initiation of breastfeeding	118	52.2%
Exclusive breastfeeding for first six months	171	75.7%
Continued breastfeeding after 6 months upto 2 years of age.	159	70.4%
Introduction of complementary foods (solid, semisolid, or soft foods)	87	38.5%
Minimum dietary diversity	103	45.6%
Minimum meal frequency	134	59.3%
Minimum acceptable diet	108	47.8%

5. DISCUSSION

During the present hospital based study, we studied the pattern and determinants of CF in infants and young children hailing from rural area. Understanding of the prevalent practices would help in identification of areas that need to be focused upon and reemphasized during counseling of the caregivers to improve nutritional status of children.

Complementary feeds were started at the end of 6 months in dismally low 21.2% children. Even by the end of 9 months, only 59.7% infants were receiving complementary feeds. This is only slightly better than NFHS-3 data for India (55.8%) and BPNI study (48.3%). Even Aggarwal et al⁷ showed that only 17.5% of mothers had started complementary feeding at recommended time. This shows that a large gap needs to be addressed at community level.

We found breastfeeding to be initiated within 1 hour of birth in 118(52.2%) babies which is considerably higher than the country profiles released by WHO which show that 22% of children 0-24 month of age received breastfeed within 1 hour in India.⁸ This higher proportion can be partly explained by lesser Cesarean deliveries and lesser NICU admission in rural India. A total of 28.8% infants were bottle fed in this study while its 14% for India as per WHO estimates.

We did not find significant relation between timely initiation of CF and various socio-demographic and maternal factors except for a positive association between better socioeconomic class and correct time of initiation of complementary feeding. This is in comparable to the findings of Sneha et al⁹ in marginalized section of the society. The proportion of infants getting minimal meal frequency was 59.3%, minimum dietary diversity was only 45.6% and minimum acceptable diet only 47.8%. This shows that although higher proportions of children are fed certain number of times, they are not fed the right diversity of food as recommended. We also found that infants of working mothers were more likely to receive (improper) thin consistency of feeds. While mothers are away for work, other family members take care of the child who doesn't have proper knowledge or motivation. This is similar to the findings of Patil et al.¹⁰ It is the usual tendency of the mothers to give thin or soft, completely mashed foods for a longer period¹¹. It therefore becomes imperative to advise mothers to differentiate the texture through different preparation and cooking methods. We also found a statistically significant association between maternal education and minimum acceptable diet: more mothers with a better educational background feed well their infants. Researchers at AIIMS Bhopal¹² also found that educated housewife mothers feed their children more appropriately.

Milk and milk based cereal preparations were the commonest food used as complementary feeding. Such a preference can be attributed to the fact that most of the mothers believe milk to be a complete food. Easy availability of animal milk and good acceptance by infants also favor its use as complementary food. Only 8.4% of infants were given

mashed fruits because mothers considered fruits as “cold” food which could result in chest congestion.

6. CONCLUSION:

Commencement of CF at 6 months in rural area is still dismally low. Socio-economic factors play a significant role in timely initiation of complementary feeding. Infants of working mothers are less likely to receive right consistency of feeds. Educated mothers are more likely to feed well their infants with a variety of foods. The most commonly used complementary food in rural area remains animal milk and milk based preparations.

Our findings indicate that lot more needs to be done for rural children. Whenever there is opportunity for health care workers, mothers should be educated about proper CF practices.

7. LIMITATIONS:

The strength of our study was direct interview of caregivers by the investigator which reduced response bias. But our study has its own limitations. First limitation is that ours is a single centre study. Second limitation is selection bias due to it being a hospital based study.

8. CONFLICT OF INTEREST: None

9. FINANCIAL SUPPORT: None.

10. REFERENCE:

1. Dewey K. Nutrition, growth and complementary feeding of breastfed infant. *Pediatr Clin North Am.* 2001;48(1):87-104.
2. World Health Organization. Guiding principles for complementary feeding of the breastfed child. 2003. Geneva: World Health Organisation.
3. Bhutta ZA, Das JK, Rizvi A, Gaffey MF, Walker N, Horton S et al. Evidence-based interventions for improvement of maternal and child nutrition: What can be done and at what cost? *Lancet.* 2013;382:452-77.
4. Black RE, Morris SS, Bryce J. Where and why are 10 million children dying every year? *Lancet.* 2003;361(9376):2226-34.
5. Bhutta ZA, Ahmed T, Black RE, Cousens S, Dewey K, Giugliani E et al. Maternal and Child Undernutrition Study Group. What works? Interventions for maternal and child undernutrition and survival. *Lancet.* 2008;371(9610):417-40.
6. Fewtrell M, Bronsky J, Campoy C, Domelloff M, Embleton N, Fidler Mis N et al. Complementary feeding: a position paper by the European Society for Paediatric Gastroenterology, Hepatology, and nutrition (ESPGHAN) committee on nutrition. *J Pediatr Gastroenterol Nutr.* 2017;64(1):119-32.
7. Aggarwal A, Verma S, Faridi M, Dayachand. Complementary feeding--reasons for inappropriateness in timing, quantity and consistency. *Indian J Pediatr.* 2008 Jan;75(1):49-53.
8. World Health Organization. Indicators for assessing infant and young child feeding practices Part 3: Country profiles. 2010. Geneva: WHO.
9. Patil SJ, Deoke AR. Complementary feeding practices among mothers of 6-24 months children in urban slums of central India. *International Journal of Medical and Health Research.* 2020;6:1-4.
10. Patil N, Bawa R, Patil RR. Study of complementary feeding practices in mothers of infants aged 6-12 months. *Int J Pediatr Res* 2016;3(3):180-184.
11. Giugliani R, J. Elsa, Victora Cesar Gomes. Complementary feeding. *Jornal de Pediatria.* 2000; Supl.3; S253-263.
12. Jain S, Bhan BD, Bhatt GC. Complementary feeding practices and their determinants among children 6-23 months of age in an outpatient hospital setting in Central India: A cross-sectional study. *J Family Med Prim Care.* 2020;9:1187-90.