Original Research Article

Pattern of complementary feeding among infants: a pilot study

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ABSTRACT

Background: The world health organization recommends exclusive breastfeeding for the first six months of life, with the addition of complementary feeds at six months with continued breastfeeds until at least the age of two. This study aimed to assess the period and pattern of initiation of complementary feeding and to find out the prevalence of malnutrition among infants (6-12 months).

Methods: A cross-sectional study was undertaken by taking 50 infants with the help of purposive sampling technique at pediatric OPD of Pradyumna Bal Memorial Hospital, KIMS, Bhubaneswar. A structured questionnaire was used to collect the baseline information by face to face interview and Anthropometric examination was conducted to assess the growth pattern. Anthropometric measurements were interpreted by using WHO Anthro Analyzer software and statistical analysis was done by using SPSS 20 Software.

Results: The study findings revealed that most of the mother (64%) has initiated the Complementary feeding after 6 months of age, 88% mothers were continuing breastfeeding along with CF. No infants were given cow’s milk. There was significant association of initiation of complementary feeding with maternal education and source of information and age of the infant. Percentage of malnourished infants is 32%. Mothers were preferring to give formula food rather than the home made one.

Conclusions: The study concluded that late introduction of complementary feeding are still prevalent in our society. The most precious and vulnerable age group of our society are suffering from malnutrition. Antenatal counselling of mother and appropriate dietary modification should be done after thorough screening during antenatal and postnatal visit.

Keywords: Complementary feeding, Breastfeeding, Malnutrition

INTRODUCTION

The right food at right time is crucial for the infants and young children to grow and develop to their highest potential. In brief 1,000 day period from the start of a woman’s pregnancy until a child’s second birthday, good nutrition is very essential. Adequate nutrition during early years of life plays an important role in achieving every child’s full human potential. The first two years of life are considered as the “critical window” for the optimum growth and development of a child. Complementary foods must be introduced at the right time throughout infancy for nutritional and developmental reasons. The capacity of exclusive breastfeeding to provide macronutrient and micronutrient requirements decreases as an infant's age increases. The introduction of complementary foods are timed to coincide with the benefits of exclusive breastfeeding for neurodevelopment and the prevention of future comorbidities after 6 months. Apart from socio-cultural, economic, and demographic considerations, infant-feeding techniques are important part of child-care
practices. Despite their importance in children's growth patterns, these habits are one of the most overlooked drivers of young child malnutrition. In order to grow and develop to their greatest potential, infants require the proper diet at the right time. To reach their greatest potential, infants require the appropriate nourishment at the right time. With growing infant age, exclusive breastfeeding's capacity to provide macronutrient and micronutrient requirements becomes reduced. The timing of complementary food introduction is based on the benefits of exclusive breastfeeding after 6 months for neurodevelopment and the prevention of future comorbidities.

As per the global recommendations of WHO and UNICEF's, strategies are set out for optimal infant feeding. Those are exclusive breastfeeding for 6 months (180 days) and complementary feeding that is safe and adequate nutritionally, starting from 6 months of age with continued breastfeeding up to 2 years of age or beyond. Complementary feeding means giving other foods in addition to breast milk. India has very high rates of under-nutrition in children with a prevalence of stunting among under five being 48%, wasting 20% and underweight 43%, which is highest in the world.

Objectives

Objectives of current study were to assess the period and pattern of initiation of complementary feeding and to find out the prevalence of malnutrition among infants (6-12 months).

METHODS

A Pilot study was undertaken with 50 infants (6-12 months) by using purposive sampling technique at paediatric OPD of Pradyumna Bal memorial hospital, Bhubaneswar, between March 1, 2020 and March 8, 2020.

Inclusion criteria

The Inclusion criteria were; infants (6-12 months) who came to pediatric OPD of Pradyumna Bal memorial hospital, Bhubaneswar, and parents those who have given consent.

Exclusion criteria

The exclusion criteria were; premature infant, infants with chronic/congenital diseases, such as heart abnormality. Don’t have any acute conditions such as fever, diarrhea and respiratory infections in last 2 weeks, previous history of hospitalization.

The data were collected by interview and observation method with the help of a structured questionnaire to assess the baseline information and the anthropometric examination was conducted by taking weight-weighing scale; length-infantometer; head circumference-measuring tape. Baseline information includes age and gender of infant, birth weight, mother’s education, socio-economic status, source of information about initiation of complementary feeding, age of initiation of complementary feeding, frequency of home made complementary food, frequency of formula feeding, breast feeding status, feeding cow’s milk.

Data analysis

Anthropometric data were interpreted by using WHO anthropalyzer software and statistical analysis was done by using SPSS 20 Software at a significant level of 0.05. Data were analyzed by using percentage distribution and Chi square test.

RESULTS

The mean age of subjects was 8±1.18 months. Among them 42 % were 6-8 months, 42 % were 8-10 months and 16 % belongs to 10-12 months. Maximum that is about 56% were male and 44 % were female. Most of the mothers of those infants (48%) had secondary level of education. Most of the infants (52%) belongs to middle class family. Maximum mothers (54%) got the information from the health worker, 36% mothers got to know about the initiation of complementary feeding from their family and 10% mothers did not have any idea about the period of initiation of complementary feeding (Table 1).

Table 1: Descriptive characteristics of demographic data (n=50).

| Characteristics | N  | %    |
|----------------|----|------|
| Age (Mean±SD)  | 8.0 ± 1.18 |
| Age (months)   |      |      |
| 6-8            | 21  | 42   |
| 8-10           | 21  | 42   |
| 10-12          | 08  | 16   |
| Gender         |      |      |
| Male           | 28  | 56   |
| Female         | 22  | 44   |
| Maternal education |  |      |
| Uneducated     | 0   | 0    |
| Primary        | 4   | 8    |
| Secondary      | 24  | 48   |
| Tertiary       | 22  | 44   |
| Socio-economic status |  |      |
| Upper          | 20  | 40   |
| Middle         | 26  | 52   |
| Lower          | 04  | 08   |
| Source of information about initiation of complementary feeding |  |      |
| Health worker  | 27  | 54   |
| Family         | 18  | 36   |
| No idea        | 05  | 10   |

The percentage distribution of period of initiation of complementary feeding shows that 14 % mothers started...
the complementary feeding at 6 months of age, 22% mothers initiated complementary feeding after 6 months of age and 64% mothers didn’t initiate the complementary feeding. Not a single mother had started the complementary feeding before 6 months of age (Figure 1).

Figure 1: Percentage distribution of age of initiation of complementary feeding (n=50).

The study concluded that late introduction of complementary feeding are still prevalent in our society. The most precious and vulnerable age group of our society are suffering from malnutrition. Antenatal counselling of mother and appropriate dietary modification should be done after thorough screening during antenatal and postnatal visit.

Figure 2: Percentage distribution of frequency of home-made and formula feeding of the infants (n=50).

Table 2: Percentage distribution of breastfeeding status of baby along with CF (n=50).

| Z-score | < -1 SD | < -2 SD | < -3SD |
|---------|---------|---------|--------|
| N (%)   | N (%)   | N (%)   |
| Weight for age | 46 (92) | 03 (06) | 01 (02) |
| Length for age | 36 (72) | 09 (18) | 05 (10) |
| Weight for length | 49 (98) | 01 (02) | 00 |
| HC for age | 46 (92) | 04 (08) | 00 |

The result evaluated that out of all participants, only 4% infants were underweight and rest of them i.e. 46% were the 6-12 months infants. About 92%, 72%, 98% and 92% infants had normal WFL, LFA, WFL and HCFA respectively. About 6%, 18% and 2% infants were underweight, stunted & wasted; 2% & 10% infants were severely underweight and severely stunted respectively (Table 2).

Figure 3: Percentage distribution of breast feeding status of baby along with CF (n=50).

About 88% mothers were continuing the breastfeeding along with complementary feed and 12% mothers had stopped breastfeeding to their baby (Figure 3). The Z-score values shows the prevalence of malnutrition among infants (n=50).

Figure 4: Percentage distribution of prevalence of malnutrition among the infants (n=50).

Figure 5: Percentage distribution of prevalence of malnutrition among the infants (N=50).
normal weight. When we analyzed the length-for-age indices, we found that among all the participants, 14% were stunted and rest 36% had normal height. Only 1% of the total participants were wasted and 49% were normal weight-for-length (BMI) (Figure 4). After analyzing the z-score of all the children, the study found that about 68% of infants are well nourished, where as 32% infants were malnourished (Figure 5). The association of various sociodemographic factors was done with different periods of initiation of CF as shown in Table 3.

### Table 3: Demographic factors associated with initiation of complementary feeding (n=50).

| Factors or category | Total | <6 months N (%) | At 6 months N (%) | >6 month N (%) | Not started N (%) | P value |
|---------------------|-------|-----------------|-------------------|----------------|------------------|---------|
| **Maternal education** |       |                 |                   |                |                  |         |
| Primary             | 04    | 0               | 0                 | 02 (50)        | 2 (50)           | 0.025*  |
| Secondary           | 24    | 0               | 7 (29.16)         | 12 (50)        | 5 (20.83)        |         |
| Tertiary            | 22    | 0               | 4 (18.18)         | 18 (81.81)     | 0                |         |
| **Socioeconomic status** |       |                 |                   |                |                  |         |
| Upper               | 21    | 0               | 6 (28.57)         | 15 (71.42)     | 0                | 0.180   |
| Middle              | 25    | 0               | 4 (16)            | 15 (60)        | 6 (24)           |         |
| Lower               | 04    | 0               | 1 (25)            | 02 (50)        | 1 (25)           |         |
| **Source of information** |       |                 |                   |                |                  |         |
| Health workers      | 27    | 0               | 6 (22.22)         | 18 (66.66)     | 3 (11.11)        | 0.000*  |
| Family              | 18    | 0               | 4 (22.22)         | 14 (77.77)     | 0                |         |
| No idea             | 05    | 0               | 1 (20)            | 0              | 4 (80)           |         |
| **Gender**          |       |                 |                   |                |                  |         |
| Male                | 28    | 0               | 6 (21.42)         | 16 (57.14)     | 6 (21.42)        | 0.225   |
| Female              | 22    | 0               | 5 (22.72)         | 16 (72.72)     | 1 (4.54)         |         |
| **Age (months)**    |       |                 |                   |                |                  |         |
| 6-8                 | 21    | 0               | 6 (28.57)         | 9 (42.85)      | 6 (28.57)        | 0.049   |
| 8-10                | 21    | 0               | 4 (19.04)         | 17 (80.95)     | 0                |         |
| 10-12               | 08    | 0               | 1 (12.5)          | 6 (75)         | 1 (12.5)         |         |

*Statistically significant with p value ≤0.05

The mothers with tertiary level of education had initiated the CF after 6 months of age and it was statistically significant (p=0.025). A statistically significant association of initiation of complementary feeding was there with source of information about CF (p=0.000) and age of the infants (p=0.049) (Table 3). Sociodemographic variables were found to have strong association with the indicators of malnutrition. The frequency of CF was significantly associated with head circumference for age (p=0.021). There was a statistically significant association between frequency of breastfeeding and weight for length (p=0.012). Socioeconomic status had a statistically significant association with head circumference for age (p=0.008). There was no significant association of initiation of CF was there with the malnutrition (Table 4).

### DISCUSSION

The initiation of complementary feeding is delayed in the majority of infants. According to this study, mothers prefer formula food over homemade cuisine. Malnutrition in its various manifestations still exists in our society. In this case, a comprehensive plan must be developed to address the malnutrition and infant feeding issues. After a comprehensive assessment during the Antenatal and Postnatal visits, the woman should receive prenatal counselling and make suitable dietary changes. At 6 months, 31.6% mothers started the complementary feeding. Only 14.28% of working mothers’ infants obtained the proper consistency of supplemental feeding. The most common reason for early complementary feeding was mothers are working, whereas the most common reason for delay is that the baby vomits or gags the additional food. Complementary foods such as animal milk and milk-based dishes were popular. Only 22% of mothers started complementary feeding at 6 months of age, according to our research. The mother’s educational status has a significant relationship with the initiation of supplemental feeding (p=0.025).

The indices of underweight, wasting, and stunting were used to determine nutritional status. According to the findings, 39 percent of babies were exclusively breastfed, only 61 percent received prolonged breastfeeding, and 50 percent were given CF at the appropriate period. Underweight, wasting, and stunting were found to be prevalent in 26 percent, 23 percent, and 28 percent of the population, respectively. Underweight was linked to the child’s age, birth order, birth weight, parents’ education level, family size, and the occurrence of fever and
Malnutrition in various kinds continues to be prevalent in our society. Malnutrition remains a serious issue that requires a concerted effort from the government, communities, and nonprofit groups working in the country to improve children's nutritional health. The mothers should be educated during the antenatal as well as postnatal period about the complementary feeding. The provision of adequate and accessible education and health services to the population in order to facilitate effective health education and the prevention and treatment of child malnutrition at the individual level.

**Recommendations**

As various forms of malnutrition still exist in our society, we have to make the people, mostly the parents aware about this condition. In this scenario, a comprehensive plan is needed to address the malnutrition and infant feeding problem should be formulated. Antenatal counselling of mother and appropriate dietary modification should be done after thorough screening during antenatal and postnatal visit. At every health setup for children, mothers should be educated about the continuation of breastfeeding and proper introduction of complementary feeding for their child as well as their near and dear ones too. Further, a large scale study should be done to get more clear picture of malnutrition.

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