

A study of inter-relationship between prolonged breast feeding and nutritional status in children aged 15 months to 3 years: An observational, case-control study

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Abstract

Background: The advantages of exclusive breastfeeding (BF) in the first 6 months of life with complementary feeding afterwards is well established but till when should BF be continued has long been a matter of debate.

Objectives: To study the inter-relationship between prolonged BF (beyond 1 year of age) and nutritional status in terms of wasting and stunting in children from 15 months to 3 years of age.

Method: This case-control study included 350 children aged 15 to 36 months belonging to the lower socioeconomic class visiting the free outpatient department (OPD) of Batra Hospital & Medical Research Centre, 250 children with BF for more than 12 months as cases and 100 children BF for one year or less as controls. Socio-demographic factors like parents' educational status and occupation, family type and family size were taken. Child characteristics like age, sex, recent illness, past illness, birth order and current feeding status were taken and recorded on a pre-coded and pre-tested proforma. Weight and height/length were taken as nutritional parameters and classified as wasting, stunting and underweight as per World Health Organisation (WHO) growth charts. Statistical analysis was performed using SPSS version 17. The clinical profile and nutritional status was analysed by Chi-square test for qualitative variables and student t-test for quantitative variables. Correlation between the duration of BF and nutritional status was done by Spearman/Pearson correlation test. Confounding factors were assessed in linear regression analysis.

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Results: The nutritional status as per the anthropometric indices studied for (height/length for age, weight for height/length, weight for age) was found to have no statistically significant difference between the two groups. The prevalence of malnutrition as per the anthropometric indices studied was found to be quite high but comparable to the NFHS-3 data for India and the UNICEF-WHO data for South Asia.

Conclusion: There was no inter-relationship between the prolonged BF and the nutritional status of the children aged 15 to 36 months.

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Introduction:

The advantages of breastfeeding (BF) are undoubtedly considerable, but by itself, breast milk is insufficient to meet the rising nutritional needs and declining stores of the rapidly growing infants after a certain age after which it forms a decreasing but valuable supplementary source of complete protein, fat, calcium and vitamins¹. At present there is a near unanimity that exclusive BF is sufficient for nutritional requirement till 6 months of age^{1,2}. However, the duration till which the BF should be continued has been a point of considerable debate with the World Health Organisation (WHO) and the Indian Academy of Paediatrics (IAP) currently recommending it till 2 years of life or beyond². Some authors maintain that prolonged BF may adversely affect a child's nutritional status, even when adequate supplementary foods³ are provided, by affecting the child's acceptance of these supplements or by disturbing the regulation of appetite⁴. The suggestion that BF may be detrimental to the child has provoked strong and sometimes hostile responses^{5,6}. Some other studies showed no significant association between prolonged BF and malnutrition^{7,8}. Certain others even showed a positive association^{9,10,11}. However, it is possible that the apparent increase in malnutrition among prolonged breastfed children may be due to an inadequate complementary feeding or confounding variables like the age of the

child^{12,13}, sex^{13,14}, birth-order, socio-economic¹⁵, demographic and cultural characteristics of the community¹⁶. Thus, this study was designed as an observational case-control study, taking the prolonged BF children (breastfed for more than 1 year) as cases and those breastfed for less than 1 year as controls, to compare the nutritional status between them. And also to study and compare the other confounding factors like maternal occupation, maternal educational status, family type, family size, birth order, top-feeding and complementary feeding between the two groups so as to evaluate the inter-relationship between prolonged breast feeding and nutritional status in the children aged 15 months to 36 months, belonging to the lower socio-economic group visiting the free OPD of our hospital.

Objectives

To study the inter-relationship between prolonged breastfeeding (breastfeeding beyond 1 year of age) and nutritional status in terms of wasting and stunting in children aged between 15 months to 3 years.

Method

It is a case-control study taking the prolonged breast-fed children (breast-fed for more than 1 year) as cases and non-prolonged breast fed children (breast fed for less than 1 year) as controls. The study was done in the Batra Hospital and Medical Research Centre, New Delhi for a period of one year. Only the children belonging to the lower socio-economic group were taken from among those visiting the free outpatient department (OPD) for general check-up or minor ailments, excluding those who were found to be seriously ill or suffering from any chronic disease. A total of 250 cases as against 100 controls were taken. The sample size was calculated properly at 95% confidence level and taking the prevalence of prolonged BF in our country as 50% and with a relative error of 20% calculating which the minimum sample size came out to be 225 for cases.

The two groups were studied and compared for various socio-demographic, maternal and child characteristics namely, family type, family size, fathers' educational status, fathers' occupational status, mothers' educational status, mothers' occupational status, birth order of the index children and current feeding status (top-feeding, complimentary feeding). The nutritional status was described as per the various anthropometric indices namely, height/length for age, weight for age and weight for height/length. The assessment was done as per the WHO charts for international reference. Malnutrition was defined as per the different anthropometric indices namely stunting

(height/length for age <SD -2), wasting (weight for height/length) and underweight (weight for age <SD -2).

The statistical analysis was done using SSPS version 17. The various variables were analysed by Chi-square test for qualitative variables and student t-test for quantitative variables. Correlation between the duration of breastfeeding was done by Spearman/Pearson correlation test. Confounding factors were assessed in linear regression analysis.

Results

Socio-demographic factors

Sex: Of the 250 cases, 134 (53.6%) were boys and 116 (46.4%) were girls. Of the 100 controls, 63 (63%) were male and 37 (37%) were female.

Mothers' educational status: The literacy rate among mothers was 52.8% in the cases group as against 45% in the control group. The difference was statistically insignificant ($p = 0.195$).

Mothers' occupation: In the cases group, 209 (83.6%) mothers were housewives. 6.4% were working in the private companies mostly on daily wages, 4.0% were labourers, 3.6% were working as domestic help in the neighborhood households (maids) and 2.4% were self-employed in small scale shops, retail outlets etc. Among the control group 49% were housewives, 19% worked in the private sector, 16% as domestic help, 11% were labourers, 4% were self-employed and 1% had government jobs. The difference between the two groups was statistically significant ($p < 0.001$).

Top-feeding: Among the cases 94% children were receiving top-feeding, 67.6% using cow's milk, 22% using buffalo's milk, 7% using formula feeds and 4% using goat's milk. Among the controls 91% children were receiving top-feeding, 73% using cow's milk, 15% using buffalo's milk, 2% using goat's milk and 1% using formula feeds. The p value of the cross analysis was 0.397, which is statistically insignificant.

Complementary feeding: Among the cases 107 (42.8%) were receiving adequate complementary feeds. Among controls 40% were getting adequate complementary feeds. The difference was insignificant ($p = 0.361$).

Time of starting complementary feeding: Among the cases, complementary feeds in the form of semisolid/ solid, household feeds were started in 0.8% at 4 months of age, 11.6% at 5 months, 58% at 6 months, 14% at 7 months, 10% at 8 months, 2.8% at 9 months and 2.8% at 10 months or beyond. Among the controls, complementary feeds were started in 10% at 5 months, 57% started at 6 months, 12% at 7 months, 17% at 8 months, 1% at 9 months and 3% at 10 months or beyond. No significance difference was seen statistically ($p = 0.585$).

Nutritional Status:

Height/length for age:

Of the 250 cases, 115 (46%) were found to be less than 2 standard deviations (<2SD) from the mean, 41 (16.4%) being less than 3SD from the mean. Among the 100 controls 48% were less than 2SD from the mean, 18% being less than 3SD from the mean. The difference between the two groups was statistically insignificant ($p = 0.141$).

Weight for height/ length:

Of the 250 cases, 57 (22.8%) were found to be less than 2SD from the mean, 9 (3.6%) being less than 3SD from the mean. Among the 100 controls 24% were less than 2SD from the mean, 3% being less than 3SD from the mean. The difference between the two groups was statistically insignificant ($p = 0.594$).

Weight for age:

Of the 250 cases, 129 (51.6%) were found to be less than 2SD from the mean, 45 (18.0%) being less than 3SD from the mean. Among the 100 controls 52% were less than 2SD from the mean, 21% being less than 3SD from the mean. The difference between the two groups was statistically insignificant ($p = 0.234$).

The results remained same after assessing the various confounders observed in the regression analysis, concluding that there was no significant association between the prolonged breastfeeding and the nutritional status of the children.

Discussion

The duration till which the breastfeeding should be continued, beyond the initial 6 months of life, has been a point of considerable debate for long. Cousens et al⁷ in their study found that in 152 case-control pairs in which both children were receiving solid foods, non-breast-feeding was associated with an increased risk of clinical malnutrition. Rao S, Kanade AN¹⁴ in their study found that there was no evidence of any protective benefit of partial breast-feeding beyond infancy. Kathleen M. Buckley⁸ also reported similar findings in children receiving partial breast feeding aged 12 to 43 months. However, Caulfield LE et al¹² indicated in his study that the children continuing breastfeeding for longer duration were shorter and lighter than those who were no longer breast-fed at the time of study.

Wafaie W Fawzi et al¹⁷ came up with a newer concept of reverse causality. They found the inverse association between breastfeeding status and weight gain was significantly larger among children of poor or illiterate mothers compared with children of relatively more affluent or literate mothers thus demonstrating that undernourished children were more likely to be breastfed for a

longer period of time compared with normal children. This was further supported by K.B. Simondon et al¹⁸ observing that women prolonged breastfeeding for undernourished children and reduced the duration for well-nourished children, probably because they of their belief of increased mortality risk following weaning.

In our study, there was no significant difference between the various confounding factors in the two groups and the nutritional status of the two groups was also more or less similar. The result of our study hence supports the earlier reasoning that there are no clear nutritional reasons to suggest that prolonged breast feeding should lead to malnutrition. No statistically significant difference was found to be present between the two groups in the various factors studied except for the maternal occupation status. It was found that among the factors studied only the maternal occupation had a significant role determining the duration of breast feeding (more than 1 year or less than 1 year). The complementary feeding was found to be predominantly inadequate in both groups, but no statistically significant difference was observed between the two.

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