

Trends of formula feeding practices among infant and young children in Bhubaneswar city

Rishav Raj, B K Behera

From Department of Paediatrics, Hi-Tech Medical College, Bhubaneswar, Odisha, India

Correspondence to: Rishav Raj, Department of Paediatrics, Hi-Tech Medical College, Bhubaneswar, Odisha, India.

E-mail: drrishavraj@gmail.com

Received – 02 April 2016

Initial Review – 16 April 2016

Published Online – 25 May 2016

ABSTRACT

Objective: To assess the formula feeding practices in Bhubaneswar city and the parameters influencing it. **Materials and Methods:** A cross-sectional study was conducted from January 1, 2014, to December 31, 2014, in OPD and well-baby clinic of Hi-Tech Medical College, Bhubaneswar and pharmacies in the different Bhubaneswar Municipal Corporation units of this city. 250 mothers having infants and young children were interviewed individually as per pre-designed questionnaire. A separate set of questionnaires for 33 pharmacies were interviewed separately. The data were analyzed by SPSS 16.0 software. **Results:** About 38% of the mothers were preparing formula with proper dilution. 47% of mothers were adhering to a single brand. Formula selling constitutes 15-20% of the average total monthly income of pharmacies. 83% of the formulas were sold without prescription. Pharmacist (30%) and media (20%) were the major influencing factors. **Conclusion:** Mothers should be clearly explained about the health hazards of formula feeding during antenatal visits and subsequent immunization visits. Infant milk substitute act should include pharmacists, druggists, and chemists.

Key words: *Formula feeding, Mothers, Pharmacist*

In a developing country like India with low access to safe water and sanitation, health outcomes differ considerably for both “mothers and infants” who formula feed compared to those who breastfeed. As a global public health recommendation, “infants should be exclusively breastfed for the first 6 months of life and should receive nutritionally adequate and safe complementary foods, whereas breastfeeding continues for up to 2 years of age or beyond” (WHO, 2002) [1]. The American Academy of Pediatrics (AAP) advocates exclusive breastfeeding (EBF) for the first 6 months of life, continuing at least through the infant’s first birthday [2-4]. As highlighted in the NFHS-3, not even half of the mothers in India follow the required norms, their aggregate of EBF being 46.3% only [5].

The nutritional, economical, immunological, and round the clock availability of the breast milk from a healthy mother makes it the perfect food for the baby, especially during the first 6 months of life. On the other hand, infants deprived of breastfeeding or dependent on formula feeding are associated with a spectrum of adverse effects including gastroenteritis, necrotizing enterocolitis, ear infections, pneumonia, obesity, diabetes, and sudden infant death syndrome [6-9]. The benefits of breastfeeding are not restricted to the infants and also cause a decline in the incidence of maternal complications such as

breast and ovarian carcinoma, weight gain, and type 2 diabetes mellitus [10].

Formula feeds deserve definite indications in medical science limited to maternal death, orphans, and maternal illness such as psychosis or shock, impaired or delayed lactogenesis and inborn errors of metabolism such as galactosemia. AAP documents its use in HIV and whenever mother chooses not to breastfeed [11]. However, in a developing country like India, due to poor maternal literacy (approximately 65.46%) and socio-economic constraints, choosing as well as using an infant milk substitute (IMS) can be a difficult task to accomplish. Often, it is associated with a varying degree of error in preparing the optimum concentration of the formula feed; hence, it proves detrimental for the child [12]. Formula feeds sometimes result in higher calorie intake, and rapid weight gain has been reported during infancy further leading to obesity [13-15]. Several studies have proved that while preparing formula feeds, safety, and hygiene measures were lacking [16-19].

Despite the increasing institutional deliveries and breastfeeding assistance through the UNICEF baby friendly initiative [20], repeated surveys show that the majority of babies receive at least some formula milk in the 1st year of life [21]. Medical practitioners having proper knowledge

about the effects/adverse effects of formula feeding should be the best guide for opting the formula feeding, but in our society, very often the mothers are influenced by her family members, neighbors, colleagues, and propagators. It remains as a fact that mothers seeking advice regarding formula feeding from sources who themselves are unaware of optimal feeding practices causing the wrong implementation. It is necessary to identify the factors, which are effective in biasing the mothers toward formula feeding and curb them at the earliest. Therefore, we planned this study to know the formula feeding practices in our region.

MATERIALS AND METHODS

This cross-sectional study was conducted over a period of 1-year from January 1, 2014, to December 31, 2014, in the well-baby clinic and OPD of Hi-Tech Medical College and Hospital, Bhubaneswar, along with the pharmacy keeping various formulas in the different Bhubaneswar Municipal Corporation (BMC) units of this city. A total of 250 mothers and 33 pharmacies were interviewed individually on the basis of a pre-designed questionnaire. Data were collected directly from the mothers and the propagators of pharmacies separately, and the records maintained by the propagators were analyzed.

Bhubaneswar is the state capital city of Odisha having 11 units (BMC units). In each unit, there are 10-30 medicine stores. Data regarding baby food were collected from the propagators, 3 medicine stores were chosen from each unit of Bhubaneswar after getting consent from the propagators of medicine stores. The mothers having children less than 2 years who visited the well-baby clinic and whose babies were taking formula feeds were included. Those, who did not give consent, stores which were not having any baby food products, mixed shops (grocery items and baby food products), babies having congenital defects, orphans, and HIV cases were excluded from the study.

The sample size was determined using the formula $\frac{4pq}{l^2}$

Where, P=Prevalence, Q=100-P, L=Allowable errors=10% of P.

The questions were asked in the local language, and the response was recorded in English. Data were entered and analyzed using SPSS 16.0 software. After filling up the questionnaire, all mothers were counseled regarding the correct infant and young child feeding practices.

RESULTS

Total 250 mothers having formula feed children <2 years in Bhubaneswar city were interviewed. Male children comprised 134 (53.6%) in number and females 116 (46.4%). As shown in Table 1, the majority were term (78.4%) and male (53.6%).

83% of the babies delivered in hospital, out of which, 33% were delivered through lower segment cesarean section (LSCS). Home delivery constitutes 17%, which showed lack of awareness about hospital delivery, and 12% of home delivery were by an unskilled attendant. 14% of mothers were enlightened about feeding practice during antenatal care. 42% of mothers in our study were employed, so breastfeeding becomes a task for them. Technique for the preparation of formula and container used for feeding were not used properly. Diluents were used properly by only 68% mothers, and proper dilution was given by only 38% mothers. Among the mothers using formula feed, 47% of mothers were sticking to a single brand, whereas the rest changed their brand frequently due to incompatibility with their child.

As shown in Table 2, baby food products constitute 1/6th of the average monthly income source of the pharmacies. 66% of the pharmacists were ignorant about the adverse effect of formula. Most of the pharmacies used to sell baby food by push selling (38%) and 45% were by parents own choice. Only 17% were given by prescription.

Pharmacies (30%) and doctors (24%) were the main sources of information regarding formula feeding practices. Obstetricians (11%) and pediatricians (8%) among doctors were the valuable informants to the mothers. Parents or grandparents (14%) and neighbors or other relatives (20%) also had important role in framing the perception regarding formula feeds. Health workers (12%) and family members (14%) together influence around a quarter of our selected sample.

DISCUSSION

Feeding practice depends on the social, economical, traditional, cultural, and educational parameters. Hence, the knowledge, attitude, and feeding practices by the mothers are based on different factors, and it is far from the ideal practices. In our study, it was observed that the incidence of formula feeding was higher in males. Discriminatory attitude toward male and female child have persisted for generations where former is always preferred. The male child was being fed more amounts than their female counterparts. A few of the parents were of the opinion that the energy requirement in a male child supersedes that of a female.

Most of the children were delivered in hospital (83%) including 67% NVD and 33% LSCS deliveries. Among home delivery, only 33% were conducted by a skilled birth attendant. In the majority of the babies delivered by LSCS, the initiation of feeding was delayed; so, the parental anxiety at this stage compelled them to initiate formula feeding. However, this could have been prevented by effective counseling by the obstetrician and pediatrician. 14% of mothers were counseled regarding the Infant and Young Child Feeding practices during antenatal visits. Decision about infant feeding must be taken

Table 1: Formula feeding parameter influenced by mother (250 mothers)

Children (%)	Term - 196 (78.4)	Preterm - 54 (21.6)	
	Male - 134 (53.6)	Female - 116 (46.4)	
Delivery (%)	Hospital - 207 (83)	Home - 43 (17)	
	NVD 140 (56%)	LSCS 68 (27)	Unskilled attendant 30 (12)
Number of formula packs used per month (mean±SD)	Male - 3.74±0.4	Female - 2.98±0.3	
Feeding advice during ANC	Yes - 35 (14)	No - 215 (86)	
Working status of mother	Employed - 105 (42)	Household works - 145 (58)	
Technique of preparation of formula feed (%)			
Diluent used	Water - 170 (68)	Bovine milk and others - 80 (32)	
	Boiled - (45)	Un boiled - (23)	
Dilution (as per instruction)	Proper - 95 (38)	Improper - 155 (62)	
		More dilute - (40)	Less dilute - (22)
Feeding equipment	Feeding bottle - 135 (54)	Katori spoon - 95 (38)	Others - 20 (8)
Product variant (brand) (%)	Single variant - 118 (47)	Multiple variant - 132 (53)	

SD: Standard deviation, ANC: Antenatal care, NVD: Normal vaginal delivery, LSCS: Lower segment cesarean section

Table 2: Use of formula feeding product as per pharmacy (33) data

Monthly income source of pharmacy (%)	Baby food products - (15-20)	Others - (80-85)
Awareness about the adverse effect of formula feed (%)	Aware - 11 (34)	Ignorant - 22 (66)
Products sold (%)	With prescription - (17)	Without prescription - (83)
	Fresh prescription - (7)	Push Parent's choice - (45)
	Old prescription - (10)	
	Pediatricians - (2)	Others such as gynecologists, quacks, MBBS - (8)

in early pregnancy. This is the time when mothers spent most of the time thinking about the baby and hence, they are more receptive to advice. In our study, 42% were working mothers, and they are more prone for formula feeding due to time constraints and stress related decrease in milk production. Government's extended maternity leave up to 6 months can be a good proceeding to promote EBF, which indirectly decreases the option for formula feeding.

The majority of the babies taken formula feed in their 1st year of life; so, it is important that policy is formulated and should be executed optimally if formula feeding is necessary. According to the UK recommendation, boiled water should be used within 30 minutes, and measures should be taken to avoid overconcentration and proper sterilization of equipment [21]. In our study, half of the mothers preparing infant formula did not fulfill the required recommendations. Various other misconceptions still exist in the society, and 32% of the mothers were using bovine milk or other liquid as diluents. Feeding bottles were used most commonly (54%) followed by katori spoons and others. Feeding bottles are currently

becoming a routine practice availed for the children spending time in crèches and among the working mothers. It has also been proven that feeding bottles carry a higher risk of diarrhea, respiratory infections, and this also adds to nipple confusion.

About 53% of mothers in our study change their formula products regularly. The common reasons for changing formula were regurgitation, abdominal colic, excessive crying, diarrhea, and constipation. Parents often changed the brand of formula milk not due to intolerance but due to overfeeding [22,23]. Decision to change the formula made by mothers or health professional arises a confusion of having an intrinsic abnormality with long-term consequences to health [23].

Baby food products constitute 15-20% of gross monthly income of a pharmacy and only 17% being sold with a prescription. Majority were sold open-handedly without any prescription, so recommendation from a doctor is not the obstacle for selling the product, and also there is no fear of any known or unknown side effect as it is a food supplement not a drug. Only 7% formulas were sold with fresh prescriptions

and rests were old prescriptions. These were prescribed just after the delivery in the first and second day of life during the need, mostly by the obstetricians followed by the pediatricians but not indicated further. The propagators of pharmacy were influenced by their profit margins on the baby food products, the extra remuneration and various luxurious facility provided by the pharmaceutical company such as tour, travel, and gifts. Most of the time, parents were anxious to know which products were sold mostly according to that they plan and took that brand.

Mothers were mainly influenced by the pharmacy, health workers, family members, and doctors. Proper knowledge in all sections of populations will be an important determinant for developing the attitude and practice toward feeding practices. The knowledge about formula feeding, when to give, how to give, to whom it should be given, its concentration, method of feeding, and its adverse effects is the least knowledge which should the majority of the population have by whom the mother is influenced. Mothers were giving these products due to so many informal reasons as a traditional practice, as neighbor's advice, to maintain the social level, comparing other formula fed child. Doctors, especially, pediatricians and obstetricians can direct mothers in a proper way but in this study, they were mostly passive.

The majority of awareness campaigns focus on "merits of breastfeeding." In spite of this, the NFHS-3 values about exclusive breastfeeding are low. Campaigns focusing on "detrimental effects of formula feeding" will help us indirectly to promote EBF in a more successful way. Mothers should be motivated about exclusive breastfeeding and the harmful effect of formula feeding during antenatal visits to limit the use of formula. Redirecting the parents about proper feeding practices in every immunization visit can be a good prospective. Health professional should take a pivotal role to prevent unnecessary use of formulas. Chemist, druggist, and most importantly parents should be sensitized about the disadvantage of formula feeding. The government should take a necessary step to prevent their promotion. The formula bottle/packet should mention the adverse effect of formula by picture or bold letter rather than writing breast milk is best. Not only Doctors and paramedics but also chemist and druggist should be included in IMS act.

CONCLUSION

In our study, male babies were more prone to formula feeding than female babies. The majority of the babies born through cesarean delivery were subjected early to formula feeding. During antenatal visits, mothers were not properly counseled about feeding practices. Inappropriate use of diluents and inadvertent dilution techniques were found frequently, and most of the parents were using feeding bottles instead of katori spoon. Many pharmacists were ignorant about the adverse effects of formula feeding. In this city of Bhubaneswar, formula

foods were available without any prescription and pushing sell by pharmacy was the leading cause of formula selling.

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Funding: None; Conflict of Interest: None Stated.

How to cite this article: Raj R, Behera BK. Trends of formula feeding practices among infant and young children in Bhubaneswar city. *Indian J Child Health.* 2016; 3(2):138-142.