

Initiation of breastfeeding and factors associated with prelacteal feeds in central Nepal

ABSTRACT

Background: Prelacteal feeds and delayed initiation of breastfeeding may lead to under-nutrition of the infant but are still prevalent in many countries.

Objectives: A prospective cohort community-based study was conducted in central Nepal to ascertain the early initiation rate of breastfeeding and factors associated with the introduction of prelacteal feeds.

Methods: Breastfeeding information was collected from 639 women who recently gave birth in the Kaski district of central Nepal. Backward stepwise logistic regression analysis was performed to ascertain pertinent factors associated with the use of prelacteal feeds.

Results: The incidence of prelacteal feeds was 9.1%, with formula milk being the most common prelacteal food for these newborns. About 67% and 90% of mothers breastfed within one hour and four hours of delivery, respectively. Women who resided in urban areas (odds ratio (OR) 2.68, 95% confidence interval (CI) 1.35 to 5.39), first time mothers (OR 2.15, 95% CI 1.15 to 4.02), and those who underwent caesarean section (OR 10.10, 95% CI 5.47 to 18.67) were more likely to give prelacteal feeds to their infants.

Conclusions: Early initiation rate of breastfeeding with colostrum as the first feed was quite common in the study area. Introduction of prelacteal feeds was associated with urban residency, first time motherhood and caesarean delivery.

Well established

The use of prelacteal feeds and the timing of breastfeeding initiation vary between and within countries. This relates to cultural beliefs and medical condition of mothers, as well as their attitude towards infant formula usage.

Newly expressed

Colostrum feeding and early initiation of breastfeeding are common practices in central Nepal, especially in rural areas. First time mothers, urban residents, and women who delivered by caesarean section are more likely to give prelacteal feeds to their newborns.

BACKGROUND

Nepal is a low-income country where a quarter of its population survive on less than one dollar a day.¹ There are more than 100 ethnic groups with a diversity of cultures and beliefs. Women usually marry at a young age (median 17.5 years), and consequently, their median age at first birth is 20.2 years.² The majority of married women are housewives engaging in agricultural work, while under five year old children constitute about 10% of the total Nepalese population of 26 million.³ According to UNICEF, Nepal has a very high stunting prevalence with 41% of the children under five years categorized as stunted.⁴

Under-nutrition of infants can be caused by many factors such as household poverty, food insecurity, inadequate care and faulty feeding practices.⁴ The use of prelacteal feeds and delayed initiation of breastfeeding are among the less than optimal feeding practices that are prevalent in many countries.⁵ Both the World Health Organisation and UNICEF have recommended breastfeeding (colostrum feeding) within the first hour of birth. Colostrum is the best food for newborns as it contains nutrients as well as antibodies essential for immunity against diseases.⁴ Early initiation of breastfeeding can enhance subsequent breastfeeding and mother-infant bonding. Many perinatal deaths are potentially preventable if newborns are breastfed within one hour of birth.⁶ A cohort study in Ghana found that the risk ratio for neonatal death increased by almost three fold when breastfeeding was delayed.^{6,7}

Although breastfeeding is almost universal in Nepal with 98% of children ever breastfed,² colostrum is often not the first feed and initiation of breastfeeding may be delayed. There are several reasons for the use of prelacteal feeds. Firstly, many mothers follow traditional cultural practices and give other foods prior to colostrum or breastmilk. Secondly, mothers

and families may not be aware of the importance of colostrum for their infant's health. Third, mothers may not feed colostrum immediately after Cesarean delivery due to drowsiness.

. In the literature, previous infant feeding studies conducted in Nepal were either cross sectional or retrospective in design,⁸⁻¹⁰ resulting in potential classification errors of breastfeeding, while details of prelacteal feeds were either lacking or subjected to recall errors. The present prospective cohort study aimed to ascertain the early initiation rate of breastfeeding and factors associated with the introduction of prelacteal feeds in central Nepal.

METHODS

Study location and participants

The study location was the hilly district of Kaski, a relatively developed district in central Nepal with an adult literacy rate of 82%.³ Annually 13,800 babies are born mainly in health facilities (81%). Of the total 455,000 population in the district, 49% belong to upper caste, 34% belong to janajati (Tibeto-Burman people), 16% belong to lower caste and the remaining 1% are classified as religious minorities (mainly Muslims and Christians),¹¹ where upper caste and lower caste refer to people of Indo-Aryan origin. The present study was part of a large community-based prospective cohort study on maternity service utilisation conducted between December 2011 and November 2012. Details of the study design and sampling were described elsewhere.¹² Briefly, a total of 701 pregnant women of 5 months or more gestation were recruited from five urban wards and seven rural *illakas* and followed up after delivery. These wards and *illakas* (consisted of villages and served by one health facility functioning as birth centre) were randomly selected from the district. All pregnant women from the selected areas were invited or identified for recruitment.

Data collection

Fifteen female local community workers collected information on socio-demographic and obstetric characteristics of the pregnant women at the baseline interview during December 2011 to January 2012. The questionnaire used in the personal interview was adapted from the validated Nepal Demographic Health Survey and pretested on 25 postpartum women for cultural appropriateness, content validity and understanding. The cohort was followed up by the same data collectors within 45 days of delivery at the second household visit. The main questions concerning infant feeding practices were: “What was your baby’s first feed after he/she was born?” and “How long after birth did you first breastfeed your baby?”

The study was approved by the Human Research Ethics Committee of Curtin University (approval number HR 130/2011), Ethical Review Board of the Nepal Health Research Council (approval number 88/2011) and the District Public Health Office of Kaski. An information sheet was distributed and read to each participant before obtaining her signed or thumb-print informed consent.

Statistical analysis

The maternal socio-demographic and obstetric characteristics are listed in Table 1. Household wealth was generated from the first component of a principal component analysis using household assets data. The asset score was then divided into wealth quintiles. Four levels of education were recorded in the baseline survey: none, primary (1-5th grade), secondary (6-10th grade), and college (after 10th grade). Only three women belonged to a religious minority and subsequently this group was merged with the janajati group. Breastfeeding information was recorded ‘yes’ if the woman had received any breastfeeding information and advice during pregnancy. The outcome variable was ‘first feed’ coded as ‘0’ if colostrum and ‘1’ if other fluids (prelacteal) were given to the newborn instead. Chi-square test was applied to

compare the two groups with respect to the maternal characteristics. Predictor variables, listed in Table 1, were selected based on their association with prelacteal feeding or early breastfeeding initiation in the literature. Backward stepwise logistic regression was then performed to identify factors significantly associated with the provision of prelacteal feeds. Adjusted odds ratios (OR) and corresponding 95% confidence interval (CI) were presented. All statistical analyses were performed using the SPSS package version 20.

RESULTS

Of the 701 pregnant women who initially participated in the first interview, 43 were lost to follow up, 9 had stillbirths, 2 had neonatal deaths, and 5 delivered on the way to the health facility. A total of 639 postpartum women took part in the second interview giving a response rate of 91.1%. Table 1 presents the socio-demographic and obstetric characteristics of the final cohort, whose mean age was 23.6 (SD 4.19, range 15-40) years. The baseline data also showed that about one-third of the women had college level education; the majority gave normal delivery at a health facility and received information or education on breastfeeding. About half of them were primiparous, resided in urban areas, and belonged to the upper caste .

The post-delivery follow up revealed that 58 (9.1%) mothers did not feed colostrum to their newborn babies as first feed. Among these mothers, 43 fed formula milk, 8 used breast milk from another woman, 4 used cow/buffalo's milk, 2 gave plain water and 1 gave sugar water. Nevertheless, 573 mothers (89.7%) initiated breastfeeding within four hours and 425 (66.5%) within one hour of giving birth. Sixty-two mothers (9.7%) breastfed after four hours and only 4 women said they were unable to breastfeed.

Table 1 also compares the mothers by type of first feed (colostrum versus prelacteal) in terms of the maternal characteristics. The two groups were significantly different in parity ($p = 0.03$), method of delivery ($p < 0.001$), residential location ($p < 0.001$) and household wealth ($p = 0.02$), with primiparity, caesarean-delivery, urban, and wealthy women being associated with prelacteal feeding. Backward stepwise logistic regression confirmed that the first three factors were significantly associated with the provision of prelacteal feeds, whereas household wealth became non-significant in the multivariable model. Women who resided in urban areas, first time mothers, and those who underwent caesarean section were more likely to give prelacteal feeds to their newborns.

DISCUSSION

The prevalence of colostrum feeding was high in the Kaski district with only 9.1% of the infants receiving prelacteal feeds. This prelacteal feeding incidence was lower than the national rate of 28% from the Nepal Demographic Health Survey,² and previously reported rate of 14% in 2005 based on 385 mothers recruited from 18 urban immunisation clinics in Kaski.⁸ Although urban residents are more likely to introduce prelacteal feeds, the observed improvement on colostrum feeding in the district might be due to the implementation of birth preparedness package and antenatal program in recent years. The package incorporated counselling by health workers and female community health volunteers on breastfeeding and importance of colostrum as the first feed. On the other hand, higher rates of prelacteal feeds have been found in Kapilbastu district (39%)⁹ and Bhaktapur district (17%)¹⁰ of Nepal. Similarly, the use of prelacteal feeds were highly prevalent in West China (93%),¹³ South China (26%),¹⁴ North India (15.4%),¹⁵ and South India (34.9%).¹⁶ Such marked differences within and between countries suggest variations in cultural attitudes influence the use of prelacteal feeds,¹⁷⁻¹⁹ as well as their availability and affordability, especially formula milk.

Infant formula followed by cow/buffalo milk, were found to be more common prelacteal foods in this study. Even though formula feeding is not yet widespread across Nepal, it is becoming popular in urban areas, as reflected by the observed higher rate of prelacteal feeds used by urban (13.4%) compared to rural (4.1%) mothers. Moreover, infant formula is commonly advertised and accessible by urban residents. They also buy the raw cow/buffalo milk sold by rural farmers. Cow/buffalo milk has become an alternative for infant feeding in Nepal, which explains the increased likelihood of urban mothers giving prelacteal feeds to their newborns.

In this study, only 9.1% of mothers did not initiate breastfeeding within four hours after delivery, which corresponded to the same incidence of prelacteal feeds. The usual practice in Nepal is for an infant to be fed as soon as possible after birth. Therefore, women tend to introduce prelacteal feeds if they are unable to initiate breastfeeding early. The initiation rate within one hour (66.5%) of birth was lower than previous report in the district (72.7%)⁸ but higher than those from the Nepal Demographic Health Survey: 44.5% nationally and 50% in western region.² The initiation rates of early breastfeeding within one hour similarly vary substantially between countries in the Asia-Pacific region, ranging from 76% in Myanmar to 88% in Samoa.⁵

The logistic regression results confirm that the use of prelacteal feeds was significantly associated with caesarean delivery. The confidence interval of odds ratio was wide. This may be due to inclusion of all deliveries in the regression model. Among 639 deliveries, only 470 occurred at hospitals, while 92 and 77 deliveries occurred at homes and birth centres. Only hospitals had operation facilities. Caesarean section may hamper immediate colostrum

feeding due to post-anaesthesia or post-operative effects to the women.^{17, 20} During this interval, babies are likely to be given prelacteal feeds. Findings from a previous facility-based study in the Kaski district⁸ and other studies conducted in India^{17, 21} also concluded the significant association between caesarean delivery and the provision of prelacteal feeds. Moreover, primiparous women have no previous experience of newborn feeding and probably less exposure to breastfeeding education and counselling than their multiparous counterparts. They are thus vulnerable to giving prelacteal foods and less prepared for breastmilk as the first feed. An analysis of the Nepal Demographic and Health Survey 2011 data also revealed that first time mothers are more likely to introduce prelacteal feeding.²²

The present study provides the first report on breastfeeding initiation and factors associated with prelacteal feeding in the central hills of Nepal. A major strength is the prospective study design with a large cohort of pregnant women recruited from the community. All participants of the follow-up interview were newly delivered mothers with infants less than 45 days of age, thus minimizing recall error. Nevertheless, the focus was on the first feed immediately after birth and subsequent infant feeding practices were not recorded due to budget and resource constraints. Further, data on types of caesarean delivery for example, repeat/elective or emergency have not been collected. Such information can further explain the association of caesarean delivery and prelacteal feeding. Although the study location is typical of the hilly regions of central Nepal, the results may not be directly generalizable to other districts of the country.

CONCLUSION

Early Initiation of breastfeeding with colostrum as first feed was common in the Kaski district of central Nepal. Introduction of prelacteal feeds was found to be positively

associated with urban residency, first time motherhood, and caesarean section. The most common prelacteal food introduced was infant formula. Further research is necessary to understand association of types of caesarean delivery and prelacteal feeding.

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CONFLICT OF INTEREST

No conflict of interest exists for all authors.

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Table 1. Maternal characteristics by type of first feed, Kaski district, Nepal.

	Colostrum	Prelacteal	Total	P^a
Characteristics	n (%)	n (%)	n (%)	
	581 (90.9)	58 (9.1)	639 (100)	
Age				0.56
15-19	80 (13.8)	11 (19.0)	91 (14.2)	
20-24	296 (50.9)	28 (48.3)	324 (50.7)	
25-40	205 (35.3)	19 (32.8)	224 (35.1)	
Parity				0.03
Primiparous	291 (50.1)	38 (65.5)	329 (51.5)	
Multiparous	290 (49.9)	20 (34.5)	310 (48.5)	
Household wealth quintiles				0.02
1	130 (22.5)	8 (14.0)	138 (21.7)	
2	115 (19.9)	6 (10.5)	121 (19.1)	
3	110 (19.0)	8 (14.0)	118 (18.6)	
4	105 (18.2)	18 (31.6)	123 (19.4)	
5	118 (20.4)	17 (29.8)	135 (21.3)	
Caste				0.18
Upper caste	306 (52.9)	33 (56.9)	339 (53.3)	
Janajati	122 (21.1)	16 (27.6)	138 (21.7)	
Lower caste	150 (26.0)	9 (15.5)	159 (25.0)	
Education				0.19
None	46 (7.9)	7 (12.1)	53 (8.3)	
Primary	124 (21.3)	9 (15.5)	133 (20.8)	

Secondary	221 (38.0)	17 (29.3)	238 (37.2)
College	190 (32.7)	25 (43.1)	215 (33.6)
Residential location			< 0.001
Urban	297 (51.1)	46 (79.3)	343 (53.7)
Rural	284 (48.9)	12 (20.7)	296 (46.3)
Place of delivery			0.35
Home	86 (14.9)	6 (10.3)	92 (14.5)
Facility	490 (85.1)	52 (89.7)	542 (85.5)
Method of delivery			< 0.001
Vaginal	522 (90.6)	27 (46.6)	549 (86.6)
Caesarean	54 (9.4)	31 (53.4)	85 (13.4)
Breastfeeding information			0.23
Yes	451 (77.6)	41 (70.7)	492 (77.0)
No	130 (22.4)	17 (29.3)	147 (23.0)

^a chi-square test between the two groups

Table 2. Factors associated with prelacteal feeds, Kaski district, Nepal.

Factor	n (%)	Adjusted odds ratio ^a (95% confidence interval)	P ^a
Residential location			0.01
Rural	296 (46.3)	1	
Urban	343 (53.7)	2.68 (1.35, 5.39)	
Parity			0.02
Multiparous	310 (48.5)	1	
Primiparous	329 (51.5)	2.15 (1.15, 4.02)	
Method of delivery			< 0.001
Normal	549 (86.6)	1	
Caesarean	85 (13.4)	10.10 (5.47, 18.67)	

^a From backward stepwise logistic regression; variables excluded are age (15-19, 20-24, 25-40), household wealth (quintiles), caste (upper caste, janajati, lower caste), education (none, primary, secondary, college), place of delivery (home, facility) and breastfeeding information (yes, no).