

Original Article

Infants' first feeds in Hangzhou, PR ChinaLiqian Qiu MD¹, Xing Xie MD¹, Andy Lee PhD² and Colin Binns PhD²¹ Women's Hospital, Medical School of Zhejiang University, Hangzhou, PR China² School of Public Health, Curtin University of Technology, Western Australia

Breastfeeding is the foundation of good nutrition and provides the basis for health throughout the life span. The WHO and the Chinese Ministry of Public Health recommend exclusive breastfeeding to six months of age. The practice of giving pre-lacteal feeds may interfere with the establishment of good breastfeeding practices and is contrary to the principles of Baby Friendly Hospital accreditation. The objective of this study was to investigate the prevalence of prelacteal feeds in a hospital in Hangzhou and the influence of this practice on breastfeeding at discharge. A longitudinal study of infant feeding was conducted in Hangzhou, China and a total of 638 mothers were recruited and interviewed while in hospital. The questionnaire included full details of infant feeding methods and factors likely to influence the initiation and duration of breastfeeding. Binary logistic regression was used to analyse factors influencing breastfeeding on discharge. In Hangzhou almost all babies are born in hospital, the median length of stay was 5.6 days and 77% of births were by caesarian section. In 26% of births the infants were given formula, water or milk as their first feed. At the time of discharge from hospital 91% of infants were receiving some breastmilk, but only 36% of mothers were exclusively breastfeeding. Breastfeeding on discharge from hospital was inversely related to giving prelacteal feeds (OR 0.115, 95% CI 0.055-0.238). While in hospital just over one quarter of infants received prelacteal feeds and these infants had a lower rate of breastfeeding on discharge.

Key Words: Zhejiang Province, China, breastfeeding, prelacteal feeds**Introduction**

Breastfeeding is the foundation of good nutrition and provides the basis for health throughout the life span. The benefits of breastfeeding to both newborn babies and the mother have been widely recognized and many national and international organizations strongly advocate breastfeeding. The WHO, UNICEF and the Chinese Ministry of Public Health recommend exclusive breastfeeding to six months of age.^{1,2} Breastmilk can continue to provide up to half or more of an infant's nutrients during the second half of the first year of life and up to one third of nutrients during the second year of life.³ The WHO policy on breastfeeding initiation and duration was summarised by the European Region in the following way: "Colostrum, secreted during the first few days of life, is particularly rich in immunoprotective factors and some vitamins and minerals, and should not be discarded or withheld from infants in favour of prelacteal feeds. Exclusive breastfeeding provides milk of sufficient quantity and quality to meet the increasing needs of the growing infant until about 6 months of age".⁴

Prelacteal feeds are defined as any feeds given before the onset of lactogenesis II, which is the onset of copious lactation that occurs within four days of birth.⁵ Prelacteal feeds are not recommended because of their influence on the onset of lactation and on perinatal morbidity and mortality.⁶ By definition, an infant who receives prelacteal feeds is not exclusively breastfed.

Despite the benefits of breastfeeding and the establishment of 'Baby Friendly' hospitals throughout China and Zhejiang Province, exclusive breastfeeding up to 4 months is still uncommon.^{7,8} A cross-sectional survey in 1997 of

391 mothers in five cities of Zhejiang Province found that the average duration of exclusive breastfeeding was 2.5 months.⁹ The Chinese government set a national target of an 'exclusive breastfeeding' rate at four months of 80% by 2000 in the Chinese Children's Development Plan for the 1990's, but this target has not yet been reached and prelacteal feeds remain commonly used.^{10,11} There have been studies of prelacteal feeds from Shandong Province and the remote Xinjiang and Tibet Regions, but none from the eastern provinces including the Zhejiang Province.¹²⁻¹⁴ Published studies have documented a number of reasons, including demographic, social and family factors that influence the initiation and duration of breastfeeding in other regions of China.¹⁵⁻¹⁷

The objectives of this study were to document the prevalence and types of prelacteal feeds given to infants while in hospital in Hangzhou and the influence of this practice on breastfeeding rates at discharge.

Methods

A longitudinal study of infant feeding was conducted in Hangzhou, China during 2005. Hangzhou is a prosperous city of 6.5 million people, the capital of Zhejiang Province, located 175km south of Shanghai.

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A cohort of 638 mothers were recruited from the First Affiliated Women's Hospital and interviewed before discharge and at regular intervals until their infants were six months of age. The questionnaire included full details of infant feeding methods and factors likely to influence the initiation and duration of breastfeeding. The questionnaire was based on those used in breastfeeding cohort studies undertaken in Australia, Vietnam and Kenya^{6,18-20}. After translation into Mandarin the questionnaire was tested in focus groups in Hangzhou to ensure cultural appropriateness.

The project was approved by the Zhejiang local research authorities (Zhejiang University, First Affiliated Women's Hospital) and the Human Research Ethics Committee of Curtin University, Australia. The purpose of the study was explained to the mothers and those who agreed to participate were assured of confidentiality and were asked to sign the consent page of the questionnaire. They were informed of their rights to withdraw from the follow up process at anytime without prejudice.

Statistical analyses were performed using the Statistical Package for Social Science (SPSS), release 12.0 (SPSS Inc., Chicago, IL, USA). Logistic regression was undertaken to analyse factors associated with prelacteal feeds and breastfeeding on discharge. The definition of 'any

breastfeeding' was taken to be the child having received breastmilk (direct from the breast or expressed) with or without other drinks, formula or other infant food.²¹

Results and discussion

In Hangzhou almost all babies are born in hospital and in this study the median length of stay was 5.6 days. The response rate of the mothers approached to participate in the study was 96% and the incidence of caesarian section was high at 77%. The average age of the mothers was 28.5 years (SD 3.3) and almost all mothers were having their first baby. Table 1 provides the descriptive statistics, characteristics of the study participants and the proportion of mothers giving prelacteal feeds. Overall 26% of the infants were given prelacteal feeds, mostly infant formula and a few were given water. Two infants from rural areas were given cows milk by their mothers. The factors related to giving prelacteal feeds are detailed in Table 2. Results from logistic regression analysis (Table 2) indicate that admission to a neonatal intensive care unit (NICU) and mother's education were significantly related to the decision to give a prelacteal feed. Almost all infants admitted to NICU were given a first feed other than breastmilk, with adjusted odds ratio (OR) 17.83 (95% CI 10.45-30.42). On the other hand, mothers who were more

Table 1. Characteristics of sample and whether prelacteal feed given (n = 638)

Variable	n	%	Prelacteal Feed Given (%)	
Age of mother (years) ^{NS}	<30 years	459	72.3	25.5
	>30 years	176	27.7	25.5
Baby gender*	male	347	54	29.4
	female	291	46	20
Birth weight*	< 2500 gm	13	2	53.5
	≥ 2500 gm	625	98	25.1
Delivery method ^{NS}	Vaginal delivery	155	23	29.7
	Caesarean section	483	77	24.4
Admission to NICU**	Yes	108	17	74.5
	No	530	83	15.5
Health insurance*	Yes	508	79	25.4
	No	130	21	33
Monthly family income**	< 5000 RMB	312	49	31.4
	≥ 5000 RMB	326	51	20.9
Mother's education**	High school or below	229	36	31.4
	University	409	64	22.5
Breastfeeding education for mother*	Yes	560	88	24
	No	78	12	38.5
Mother's occupation ^{NS}	Worker	138	22	28.3
	Professional	494	78	25.3

Relationship between the specified variable and whether prelacteal feeds given: NS not significant, * $p < 0.05$, ** $p < 0.01$

Table 2. Factors associated with giving a prelacteal feed in Hangzhou.*

Variable	Adjusted odds ratio	95% confidence interval	p value
Admission to NICU	17.8	10.5-30.4	0.00
Mother's education (2 groups)	0.61	0.18-0.90	0.04

-2 log likelihood 540.744. * Results of stepwise logistic regression including the following variables: age of mother, attended antenatal breastfeeding education class, birth weight, delivery method, mother's education, father's attitude to breastfeeding, father's occupation, grandmother breastfed her children, grandmother's feeding preference, family income, mother's occupation, admission to NICU, and when infant feeding method decision was made.

Table 3. Significant factors associated with 'any breastfeeding' at discharge*

Variable	Adjusted odds ratio	95% confidence interval	p value
Prelacteal feed given	0.12	0.06-0.24	0.00
Admission to NICU	0.39	0.16-0.92	0.03
Father's occupation(worker)	2.69	1.23-5.89	0.01
Grandmother's preference (supported breastfeeding)	3.60	1.43-9.04	0.01

-2 log likelihood 385.977. * Results of stepwise logistic regression including the following variables: age of mother, attended antenatal breastfeeding education class, birth weight, delivery method, mother's education, father's attitude to breastfeeding, father's occupation, grandmother breastfed her children, grandmother's feeding preference, family income, mother's occupation, admission to NICU, and when infant feeding method decision was made

educated (received at least 12 years of education) were less likely to give prelacteal feeds to their infants (OR 0.610, 95% CI 0.379-0.982).

On discharge from hospital 91% of infants were receiving some breastmilk, but only 36% of mothers were exclusively breastfeeding. Table 3 presents the logistic regression results for any breastfeeding on discharge. We found that 'any breastfeeding' on discharge from hospital was inversely related to giving prelacteal feeds (OR 0.115, 95% CI 0.055-0.238). Other significant factors related to 'any breastfeeding' on discharge (Table 3) were admission to NICU (OR 0.386, 0.162-0.922), the father's occupation ('workers', that is those with middle level manufacturing employment, were more likely to breastfeed, OR 2.687, 1.226-5.888) and the grandmother's preference (being supportive of breastfeeding, OR 3.595, 1.430-9.038).

While prelacteal feeds are not routinely recommended by any expert authority, it is widely practiced in many different cultures, including China. A study in Jinan City, Shandong Province found that prelacteal feeds were common and that 66% were given water, infant formula, glucose or other prelacteal feeds.¹² In the west of China, in the Xinjiang Uygur Autonomous Region, the overall rate of prelacteal feeds was 52%, but it was lower in the Han ethnic group at 22%, similar to the mothers in Hangzhou.¹⁴ In other developing countries high rates are often found and in rural Bangladesh rates as high as 77% were reported in a 1995 study.²² In a lower-socio economic area of Karachi, Pakistan, the rate was 55%, where ethnicity and the type of birth attendant influenced prelacteal feeds.²³

Colostrum, the secretion produced in the first few days after giving birth, provides all the nutrients, including water, required by the neonate.⁴ In composition, it differs from both transitional milk and mature milk, containing higher levels of protein, vitamin A and vitamin B12 and less fat. It also contains lactoferrin, immunoglobulin A, enzymes, maternal antibodies, living cells— leukocytes, neutrophils and macrophages, and non-pathogenic bacteria, which act in the gut of the newborn to limit the growth of pathogenic bacteria and viruses and to protect against illness.²⁴ Best practice in infant feeding is to place the infant at the breast as soon as practicable after delivery, within one hour, and to offer colostrum to the infant.²⁵ In a systematic review of the influence of prelacteal feeds on breastfeeding at 4 and 16 weeks, Sza-

jewska identified 56 studies, but only one met all of their inclusion criteria.²⁶ In this study from Spain giving prelacteal feeds of glucose water reduced the proportion of infants subsequently being breastfed.²⁷

Ideally a randomised controlled trial should be undertaken to study the effects of prelacteal feeds of breastfeeding outcomes. However because of the existing evidence and the benefits of exclusive breastfeeding, it is doubtful that such a study would be approved by institutional ethics committees.²⁸ The accumulation of evidence from well conducted observational studies from different regions of the world may have to suffice in providing evidence of the disadvantages of prelacteal feeds. While the present study is an observational study, it does provide additional evidence of links between prelacteal feeds and reduced breastfeeding initiation.

The European Commission has released a series of recommendations on infant feeding and state: 'the healthy newborn infant should not be given supplements of infant formula, glucose solution, water, tea or camomile tea.'²⁹ They detail the few medical indications for the use of supplementary feeds, which includes a birth weight <1500 grams, gestational age <32 weeks, >10% weight loss and serious illness. The Chinese government has set breastfeeding policies that are consistent with international recommendations. Although the appropriate targets and policies have been set, many infants are given prelacteal feeds. Further education of mothers and health staff about the adverse effects of prelacteal feeds is required.

There are several limitations that should be considered when interpreting the results of this study. The sample was restricted to the City of Hangzhou and further studies are needed to document the practices in other parts of the Province, including suburban and rural areas.

While in hospital most infants received supplementary feeds. The use of prelacteal feeds was related to breastfeeding at discharge. The relatively high rate of prelacteal feeds suggests that further education for mothers and health services staff on achieving breastfeeding guidelines would be of benefit.

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