



## Perceived Lactation Failure: Maternal, Feeding, and Growth Correlates among Hospitalized Neonates in Northern India

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### KEYWORDS:

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### ABSTRACT

**Background:** Perceived insufficient milk remains an important reason for early supplementation and breastfeeding discontinuation among hospitalized neonates.

**Objectives:** To assess clinical profile of mother–infant dyads with perceived lactation failure and assessed post-discharge growth following structured lactation support.

**Methods:** This descriptive cross-sectional study was conducted in a tertiary care neonatal unit in northern India from September 2024 to August 2025. Neonates weighing 1000 g or more and whose mothers were willing to breastfeed were enrolled. Maternal perception of breast milk sufficiency was recorded using a structured interview, breast milk sodium concentration was measured, and neonatal anthropometry was assessed at admission, discharge, and follow-up up to three months.

**Results:** Of 570 mothers, 376 (66.0%) reported insufficient milk perception and 194 (34.0%) reported adequate milk output. Elevated breast milk sodium (>16 mmol/L) was found in 284 mothers (75.5%) in the crisis group compared with 42 (21.6%) in the non-crisis group. Reduced urine passage, defined as fewer than six voids in 24 hours, was reported in 300 infants (79.8%) versus 30 (15.5%), respectively. Delayed initiation of breastfeeding, cessation of suckling, prelacteal feeds, and use of bottles or pacifiers were more common in the crisis group. Infants in the crisis group had lower admission and discharge weights, but post-discharge growth velocity in preterm and term infants was comparable between groups over three months.

**Conclusion:** Perceived lactation failure was common and was strongly associated with delayed initiation of breastfeeding and other modifiable feeding practices. Structured lactation counselling and repeated reinforcement should be integrated into routine neonatal care.

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## 1. INTRODUCTION

Breastfeeding is the biologically preferred method of infant feeding and remains central to newborn survival, growth, and development.<sup>1</sup> Despite these benefits, many mothers discontinue breastfeeding early because they believe that their milk is insufficient.<sup>2</sup> In neonatal units, this perception is often intensified by infant illness, maternal anxiety, delayed mother–baby contact, and early exposure to bottles or prelacteal feeds.<sup>3</sup>

Perceived milk insufficiency is clinically important because it can begin a vicious cycle: concern about low milk output reduces suckling frequency, reduced suckling lowers breast stimulation, and actual milk transfer may decline. Indian evidence on this problem is still limited, especially among hospitalized outborn neonates who are under stress and frequently separated from their mothers.<sup>4-7</sup> A clearer description of this problem is needed because lactation support is often provided in an unstructured manner, and the true burden of perceived lactation failure in such settings is not well documented.

The present study was therefore designed to fill this gap by evaluating the frequency and pattern of perceived lactation failure in mothers of hospitalized neonates and by assessing whether structured counselling could support post-discharge growth. The study also explored whether simple clinical and biochemical markers of intake could help distinguish genuine feeding inadequacy from transient maternal perception.

The primary aim was to estimate the frequency of perceived breast milk insufficiency among mothers of hospitalized neonates. The secondary aims were to compare neonatal and feeding characteristics between the crisis and non-crisis groups and to evaluate growth velocity after discharge up to three months.

## 2. MATERIALS & METHODS

**2.1 Study design:** This was a descriptive cross-sectional study with prospective follow-up after discharge.

**2.2 Setting:** The study was conducted in the Department of Pediatrics of a tertiary care health center in northern India in collaboration with Department of Community Medicine from September 2024 to August 2025. The unit provides neonatal intensive care for sick and low birth weight outborn neonates.

**2.3 Participants:** Neonates weighing at least 1000 g and whose mothers were willing to breastfeed were eligible. Mothers who refused consent and dyads with incomplete follow-up were excluded. A total of 570 mother–infant dyads were included in the final analysis.

**2.4 Sampling:** Consecutive eligible neonates admitted during the study period were enrolled until the required sample was reached. For analysis, mothers were categorized into crisis and non-crisis groups according to their response to the question on perceived milk sufficiency.

**2.5 Ethics:** Institutional ethics committee approval was obtained before the start of the study. Informed consent was taken from the mothers before enrolment.

At enrolment, relevant maternal and neonatal history was recorded and a detailed clinical examination was performed. Anthropometry included weight measured on a calibrated electronic scale without clothing, head circumference measured with a non-stretchable fiber tape, and length measured with an infantometer. Follow-up anthropometry was repeated at each visit until three months after discharge.

Standard lactation support was provided to all mothers. This included unrestricted access to the baby in the nursery, a bed for the mother during hospitalization, encouragement for active involvement in newborn care, teaching of correct manual expression of breast milk, frequent expression both day and night, repeated attempts at breastfeeding, non-nutritive sucking when direct breastfeeding was delayed, confidence building, avoidance of negative reinforcement, and breastfeeding as a discharge precondition whenever clinically feasible.

### 2.6 Study Tools

A structured questionnaire was used to record maternal perception of milk sufficiency, reasons for believing that milk was inadequate, timing of breastfeeding initiation, use of prelacteal feeds, night feeds, feeding duration, use of bottles or pacifiers, and maternal concerns regarding the infant's intake. The items were adapted from WHO/UNICEF breastfeeding counselling materials and reviewed during repeated bedside interviews.<sup>8,9</sup> Breast milk sodium was assessed by ion-selective method.

### 2.7 Operational Definitions

*Perceived lactation failure* or *crisis group* was defined as maternal reporting of inadequate breast milk output for the infant during hospitalization, consistent with the study proforma. The *non-crisis group* comprised mothers reporting sufficient milk output. Elevated breast milk sodium was defined as a sodium level greater than 16 mmol/L. Reduced urine output was defined as fewer than six wet diapers or voids in 24 hours. Delayed initiation of breastfeeding referred to failure to start breastfeeding within the early postnatal period as documented in the case record.

### 2.8 Statistical & Data Analysis

Data were entered in Microsoft Excel and analysed using SPSS version 25 (IBM Corp., Armonk, NY, USA). Categorical variables were summarized as frequency and percentage, and continuous variables were summarized using medians with interquartile ranges or means with standard deviation as applicable. Group comparisons for categorical variables were performed using the chi-square test; Fisher's exact test was used where expected cell counts were small. Continuous variables were compared using Student's t test for normally distributed data and non-parametric equivalent tests when distributional assumptions

were not satisfied. A two-sided p value of less than 0.05 was considered statistically significant. Percentages were calculated using the total group denominator and rounded to one decimal place for consistency.

### 3. RESULTS

A total of 570 mother–infant dyads met the inclusion criteria and were analysed. Of these, 376 mothers (66.0%) perceived that their milk was insufficient and were categorized as the crisis group, while 194 mothers (34.0%) reported adequate milk output and formed the non-crisis group.

#### 3.1 Neonatal and feeding variables

The crisis group had a markedly higher proportion of biological and feeding markers suggestive of lactation difficulty. Elevated breast milk sodium (>16 mmol/L) was present in 284 mothers (75.5%) in the crisis group compared with 42 mothers (21.6%) in the non-crisis group, indicating a highly significant difference. Similarly, reduced urine passage, defined as fewer than six voids in 24 hours, was reported in 300 infants (79.8%) in the crisis group versus 30 infants (15.5%) in the non-crisis group. Delayed or absent initiation of breastfeeding was more frequent in the crisis group, with breastfeeding not initiated in 156 mothers (41.5%) compared with 46 mothers (23.7%) in the non-crisis group. Cessation of suckling was also more common in the crisis group, affecting 288 infants (76.6%) versus 50 infants (25.8%). Prelacteal feeding was reported by 230 mothers (61.2%) in the crisis group and 66 mothers (34.0%) in the non-crisis group. Use of bottles or pacifiers was reported in 136 infants (36.2%) in the crisis group and in none of the non-crisis group. (Table 1)

**Table 1. Comparison of neonatal and feeding variables in the crisis and non-crisis groups (N=570)**

Variable	Crisis group (n=376), n (%)	Non-crisis group (n=194), n (%)	P value
Breast milk sodium >16 mmol/L	284 (75.5)	42 (21.6)	<0.001
Urine passage <6 times/24 h	300 (79.8)	30 (15.5)	<0.001
Birth asphyxia	82 (21.8)	64 (33.0)	0.04
Sepsis	144 (38.3)	90 (46.4)	0.18
Congenital abnormality	30 (8.0)	6 (3.1)	0.11
Prematurity	28 (7.4)	28 (14.4)	0.06
Breastfeeding not initiated	156 (41.5)	46 (23.7)	<0.05
Cessation of suckling	288 (76.6)	50 (25.8)	<0.001
Prelacteal feed given	230 (61.2)	66 (34.0)	<0.001
Night feeds present	46 (12.2)	146 (75.3)	<0.001
Long feeds present	92 (24.5)	174 (89.7)	<0.001
Bottles/pacifiers used	136 (36.2)	0 (0.0)	NA

With regard to neonatal morbidity, birth asphyxia, sepsis, congenital anomalies, and prematurity were present in both groups, although prematurity was relatively more common in the crisis group. Babies in the crisis group also weighed less at admission and discharge, suggesting that perceived lactation failure clustered with poorer early neonatal status.

#### 3.2 Growth assessment post discharge

Growth assessment after discharge showed that velocity of weight gain, head circumference growth, and linear growth were comparable between groups for both preterm and term infants over the follow-up period. In preterm infants, median weight gain was 23.3 g/day in the crisis group and 24.5 g/day in the non-crisis group, with comparable head circumference and length increments. Among term infants, weight gain was 26.9 g/day versus 27.2 g/day, respectively, and head circumference and length gain were similarly similar. None of the between-group differences in growth velocity reached statistical significance. (Table 2)

**Table 2. Growth velocity in preterm and term infants in the crisis and non-crisis groups**

Variable	Crisis group (n=376)	Non-crisis group (n=194)	P value
Preterm weight gain, g/day	23.3 (20.3-28.1)	24.5 (20.8-29.3)	>0.05
Preterm head circumference, cm/week	0.68 (0.50-0.86)	0.77 (0.42-0.94)	>0.05
Preterm length gain, cm/week	0.84 (0.62-0.98)	0.79 (0.54-0.96)	>0.05
Term weight gain, g/day	26.9 (24.2-29.4)	27.2 (24.4-30.6)	>0.05
Term head circumference, cm/week	0.38 (0.25-0.67)	0.48 (0.27-0.75)	>0.05
Term length gain, cm/week	0.82 (0.52-0.98)	0.83 (0.55-0.97)	>0.05

#### 4. DISCUSSION

The present study demonstrates that perceived lactation failure is common among mothers of hospitalized neonates and is closely linked to feeding disruption, delayed breastfeeding initiation, and certain neonatal clinical factors. The observed prevalence is comparable to earlier Indian reports in which perceived insufficient milk was frequently identified as a major reason for early supplementation and breastfeeding discontinuation.<sup>6,7</sup>

The strong association between perceived insufficiency and elevated breast milk sodium is important because biochemical evidence may help distinguish true lactation compromise from maternal anxiety alone. Likewise, the association with reduced urine output provides a clinically useful bedside marker of inadequate intake. These findings are consistent with prior Indian data and support the need for structured counselling rather than immediate substitution with top feeds.<sup>7</sup>

Delayed initiation of breastfeeding, prelacteal feeds, cessation of suckling, and bottle or pacifier use were more common in the crisis group and likely contributed to reduced effective milk removal. This is biologically plausible because frequent suckling is essential for milk production and maintenance. Earlier work has shown that even when mothers perceive insufficiency, intensive breastfeeding support can restore confidence and improve feeding outcomes.<sup>10,11</sup>

An important finding of the present study is that post-discharge growth remained adequate and did not differ significantly between groups once breastfeeding support was provided. This suggests that early lactation counselling may mitigate the adverse effects of perceived milk insufficiency and stabilize infant growth trajectories. The results are in line with the principle that early, repeated, hands-on support is more effective than reassurance alone.<sup>12-15</sup>

##### 4.1 Limitations

The study has some limitations as well. It was conducted in a tertiary neonatal unit, where maternal stress, infant illness, and separation from the baby may have amplified the perception of insufficient milk. The findings therefore may not be directly generalizable to healthy term newborns in the community. In addition, the design was descriptive and did not allow causal inference. Nevertheless, the study addresses an important and underexplored problem in a vulnerable population.

#### 5. CONCLUSION

Perceived lactation failure was common among mothers of hospitalized neonates and was associated with delayed initiation of breastfeeding, prelacteal feeding, cessation of suckling, and bottle or pacifier use. Breast milk sodium and infant urine output provided useful supportive markers of inadequate milk transfer. Structured breastfeeding counselling with repeated reinforcement should be integrated into routine neonatal care to prevent unnecessary supplementation and to support optimal infant growth.

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**Declaration of conflicting interest:** None

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