

Study on initiation and progression of breastfeeding in late preterm babies admitted in a tertiary care hospital

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Abstract

Background: Late preterm infants (34+0/7 to 36+6/7 weeks) have physiological immaturity that may interfere with effective breastfeeding. Delayed initiation and poor breastfeeding technique may contribute to inadequate feeding, excessive weight loss, jaundice, hypoglycaemia, and hospital readmission.

Objective: To assess the initiation and progression of breastfeeding in late preterm infants and to evaluate the association of gestational age, timing of breastfeeding initiation, and hospital admission with breastfeeding performance and weight gain.

Materials and Methods: This prospective observational study was conducted in a tertiary care hospital. During the study period, 9,634 deliveries occurred, of which 885 (9.18%) were late preterm births. A total of 422 late preterm infants were enrolled, and 398 completed one-

month follow-up. Breastfeeding initiation time, LATCH scores, and weight gain were assessed at initial feeding, discharge, and one month of age. Associations with gestational age and admission status were analysed statistically.

Results: Breastfeeding was initiated within 1 hour in 168 (42.2%) infants and within 3 hours in 269 (67.6%). The proportion of infants with a good LATCH score (≥ 8) increased from 26.9% at initial assessment to 55.0% at discharge and 80.2% at one month. Poor LATCH scores (< 5) decreased from 22.4% initially to 6.8% at discharge and 3.3% at one month. Breastfeeding performance was significantly better with increasing gestational age ($p < 0.001$). Adequate weight gain increased from 45.5% at discharge to 80.9% at one month. Earlier breastfeeding initiation was significantly associated with better LATCH scores and weight gain. Infants requiring postnatal

admission had lower LATCH scores and longer hospital stays than those managed in the postnatal ward.

Conclusion: Breastfeeding skills in late preterm infants improve considerably during the early postnatal period. Early initiation of breastfeeding is associated with better breastfeeding performance and weight gain. Structured lactation support, serial LATCH assessment, and close follow-up are particularly important for infants born at lower gestational ages and those requiring hospital admission.

Keywords: Late Preterm Infants, Breastfeeding Initiation, LATCH Score, Breastfeeding Progression, Weight Gain, Lactation Support.

Introduction

Breastfeeding is the optimal form of nutrition for newborn infants and provides essential nutrients, immunological protection and developmental benefits. Early initiation of breastfeeding, preferably within the first hour after birth, facilitates the intake of colostrum and is associated with improved breastfeeding continuation and neonatal outcomes. The World Health Organization (WHO) recommends that mothers be supported to initiate breastfeeding as soon as possible after birth and that preterm infants who are able to breastfeed should be put to the breast as early as possible.^{1,2}

Preterm birth remains an important cause of neonatal morbidity and mortality worldwide. Among preterm infants, those born between 34+0/7 and 36+6/7 weeks of gestation are classified as late preterm infants (LPTs). Although they are often physiologically more mature than very preterm infants, LPTs remain developmentally immature compared with term neonates and have an increased risk of feeding difficulties, hypoglycaemia, hyperbilirubinaemia, temperature instability, respiratory problems and hospital readmission.^{3,4}

Breastfeeding in late preterm infants can be particularly challenging because the neurological and physiological mechanisms required for effective feeding are still developing. Coordination of sucking, swallowing and respiration improves considerably between approximately 33 and 36 weeks of postmenstrual age. Consequently, some late preterm infants may demonstrate ineffective latch, reduced sucking strength, early fatigue, prolonged feeding time and inadequate milk transfer.^{5,6} These difficulties may result in delayed establishment of breastfeeding and inadequate weight gain.

Compared with term infants, late preterm infants have lower rates of exclusive breastfeeding and are at increased risk of early breastfeeding cessation. A prospective study of first-time mothers reported that only 63.8% of mothers of late preterm infants were breastfeeding at one month, compared with 76.5% of mothers of term or post-term infants.⁷ Another study found that late preterm infants were substantially less likely than term infants to be exclusively breastfed, highlighting the importance of specific breastfeeding support for this population.⁸

The timing of breastfeeding initiation is an important modifiable factor. Early skin-to-skin contact and early initiation of breastfeeding facilitate establishment of breastfeeding and may increase the likelihood of continued exclusive breastfeeding.^{1,2} In late preterm infants, however, feeding may be delayed because of neonatal instability, poor feeding behaviour, hypoglycaemia, jaundice or admission to a neonatal unit. A recent prospective cohort study found that early first latch-on and skin-to-skin contact were associated with exclusive human milk feeding among late preterm infants.⁹

Objective assessment of breastfeeding is therefore important for identifying neonates who require additional

support. The LATCH scoring system, developed by Jensen et al., provides a structured assessment of five components of breastfeeding: latch, audible swallowing, nipple type, maternal comfort and hold. Each component is scored from 0 to 2, producing a total score of 0–10.¹⁰ Serial assessment of LATCH scores can help identify feeding difficulties and monitor improvement during hospitalisation and follow-up.

In addition to breastfeeding effectiveness, adequate postnatal growth is an important indicator of successful feeding in late preterm infants. Growth assessment using appropriate preterm growth charts, such as the Fenton charts, allows assessment of weight in relation to gestational age.¹¹ Poor feeding and inadequate milk intake may contribute to suboptimal early weight gain, particularly among infants born at earlier gestational ages. Breastfeeding difficulties in late preterm infants are multifactorial and may be influenced by gestational age, birth weight, maternal factors, mode of delivery, timing of first feed and neonatal morbidity. A systematic review reported that breastfeeding rates are lower among moderate and late preterm infants and that parental information and direct healthcare support can improve breastfeeding outcomes.¹² Therefore, early identification of feeding problems and continued breastfeeding support are essential.

Despite the importance of breastfeeding in late preterm infants, there is limited information regarding the relationship between timing of breastfeeding initiation, progression of LATCH scores and subsequent weight gain, particularly in routine tertiary-care neonatal settings. The present study was therefore undertaken to evaluate the initiation and progression of breastfeeding among late preterm babies born at a tertiary care hospital, with serial

assessment of breastfeeding effectiveness and weight gain up to one month of age.

Materials And Methods

Study Design and Setting

This was a descriptive observational study conducted in the Department of Paediatrics, Karnataka Institute of Medical Sciences (KIMS), Hubballi. The study population comprised late preterm babies born at KIMS, defined as neonates born between 34+0/7 and 36+6/7 weeks of gestation.

Source of Data and Study Population

All late preterm babies born at KIMS during the study period were considered for enrolment. Gestational age was confirmed using first-trimester ultrasonography wherever available. Eligible neonates were identified by the attending paediatrician and enrolled after obtaining informed consent from the parents.

Inclusion Criteria

The study included:

- All babies born at KIMS with a gestational age of 34+0/7 to 36+6/7 weeks.
- Babies whose parents provided informed consent for participation.

Exclusion Criteria

Babies were excluded if they had:

1. Major congenital malformations, including cleft lip or cleft palate.
2. Apgar score <6 at 5 minutes.
3. Central nervous system abnormalities.
4. Transfer into or out of the study facility.
5. Haemodynamic instability since birth.

Methods of Data Collection

After enrolment, maternal demographic and relevant obstetric details associated with preterm delivery were

documented. A detailed maternal and perinatal evaluation was performed for each mother–neonate pair.

The neonates underwent routine clinical examination, and vital parameters were recorded. Gestational age was additionally assessed using the modified Ballard scoring system. Anthropometric measurements were recorded, and growth was assessed using the Fenton growth chart. Mothers were counselled regarding appropriate breastfeeding practices, maintenance of neonatal warmth, and kangaroo mother care (KMC).

Assessment of Breastfeeding

The time of initiation of feeding was documented for each neonate. Progress of breastfeeding was assessed using the LATCH scoring system. The LATCH score consists of five parameters: Latch, Audible swallowing, Type of nipple, Comfort, and Hold, with each parameter scored from 0 to 2, giving a maximum total score of 10.

The LATCH score was assessed at the following time points:

- Within 24 hours of life
- At discharge
- At 1 month of life

The total score was interpreted as follows:

- 8–10: Good latch and feeding; minimal or no intervention required.
- 6–7: Fair latch and feeding; some intervention or support may be required.
- ≤5: Poor latch and feeding; significant intervention or support required.

Monitoring of Neonates Admitted to NICU

Late preterm babies requiring admission to the NICU were monitored for feeding-related problems at 12-hourly intervals. Relevant maternal, perinatal, neonatal, and feeding-related information was recorded using a structured study proforma.

The enrolled babies were subsequently assessed at discharge and at 1 month of age to evaluate breastfeeding status and weight gain.

Assessment of Weight Gain

Weight was assessed at discharge and at one month of age. Weight gain was considered adequate when it was 15–20 g/kg/day.

Study Outcome

The primary outcome of the study was establishment and continuation of exclusive breastfeeding at the end of 1 month of life.

Sample Size Estimation

The sample size was calculated based on the reported proportion of exclusive breastfeeding at discharge among late preterm babies admitted to the NICU, which was 51%, as reported by Rakel B. Jónsdóttir et al.

The sample size was calculated using the formula:

$$N = Z^2_{1-\alpha/2} \times p \times (100 - p) / d^2$$

where:

- $Z_{1-\alpha/2} = 1.96$, standard normal variate corresponding to a 95% confidence level;
- $p = 51\%$, expected proportion of exclusive breastfeeding;
- $d = 5\%$, absolute precision.

Using these parameters, the calculated sample size was 384 late preterm babies. Considering a 10% non-response/loss to follow-up, an additional 38.4 subjects were considered, giving a final sample size of approximately 422 late preterm babies.

Statistical Analysis

Data were entered into a Microsoft Excel spreadsheet and analysed using Statistical Package for the Social Sciences (SPSS), version 22.0. Categorical variables were expressed as frequency and percentage. The Chi-square test was used to assess associations between categorical

variables. A p-value <0.05 was considered statistically significant.

Results And Observations

During the study period, a total of 9,634 deliveries occurred at the tertiary care hospital. Of these, 885 (9.18%) were late preterm deliveries. Late preterm babies constituted 54.3% of all preterm births during the study period. A total of 422 late preterm babies were enrolled in the study, of whom 24 were lost to follow-up at one month. Therefore, outcome assessment at one month was available for 398 neonates.

Table 1: Baseline demographic and maternal characteristics of the study population

Parameter	Frequency	Percentage(%)
Sex (N=398)		
Female	188	47.3
Male	210	57.7
Maternal age (N=422)		
<20 years	97	23.1
21–30 years	304	71.9
>31 years	21	5.0
Maternal haemoglobin (N=394)		
≥11 g/dL	41	10.3
7–10 g/dL	195	49.1
<7 g/dL	158	39.6
Mode of delivery (N=398)		
Normal/assisted vaginal delivery	210	52.8
Caesarean section	188	47.2
Gravida (N=398)		
Primigravida	175	44.0
Multigravida	223	56.0

The study population consisted predominantly of male neonates. Most mothers belonged to the 21–30-year age group (71.9%). Anaemia was common, with 49.1% of mothers having haemoglobin levels of 7–10 g/dL and 39.6% having haemoglobin <7 g/dL. Vaginal delivery accounted for 52.8% of deliveries, while 47.2% were delivered by caesarean section. Multigravidas constituted 56% of the study population.

Table 2: Distribution of late preterm babies according to gestational age, birth weight and growth status

Parameter	Frequency	Percentage(%)
Gestational age (N=398)		
34 weeks + 6 days	65	16.9
35 weeks + 6 days	132	33.1
36 weeks + 6 days	201	50.0
Birth weight (N=398)		
<1.5 kg	35	9.0
1.6–2.5 kg	212	53.0
>2.5 kg	151	38.0
Growth status (N=398)		
Small for gestational age	121	30.4
Appropriate for gestational age	211	53.0
Large for gestational age	66	16.6

Half of the study population belonged to the 36-week gestational age group. Most neonates weighed between 1.6 and 2.5 kg. Regarding growth status, 53.0% were appropriate for gestational age, 30.4% were small for gestational age and 16.6% were large for gestational age.

Table 3: Distribution according to initiation of breastfeeding

Initiation of breastfeeding	Frequency (N=398)	Percentage (%)
≤1 hour	168	42.2

1–3 hours	101	25.4
3–6 hours	94	23.6
>6 hours	35	8.8
Total	398	100

Breastfeeding was initiated within the first hour of life in 42.2% of late preterm babies. A further 25.4% initiated breastfeeding within 1–3 hours, whereas 8.8% initiated breastfeeding after more than 6 hours.

Table 4: Distribution according to LATCH score at different time points

LATCH score	First assessment n (%)	At discharge n (%)	At 1 month n (%)
<5	89 (22.4)	27 (6.8)	13 (3.3)
6–7	202 (50.8)	152 (38.2)	66 (16.6)
≥8	107 (26.9)	219 (55.0)	319 (80.2)
Total	398 (100)	398 (100)	398 (100)

There was progressive improvement in breastfeeding performance during follow-up. At the initial assessment, 50.8% of neonates had a LATCH score of 6–7 and 22.4% had a score <5. At discharge, the proportion with a good LATCH score (≥8) increased to 55.0%, which further increased to 80.2% at one month. The proportion with a poor LATCH score (<5) declined from 22.4% initially to 3.3% at one month.

Table 5: Distribution according to weight gain at discharge and one month

Weight gain	At discharge n (%)	At 1 month n (%)
Adequate	181 (45.5)	322 (80.9)
Inadequate	217 (54.5)	76 (19.1)
Total	398 (100)	398 (100)

At discharge, 45.5% of late preterm babies had adequate weight gain, whereas 54.5% had inadequate weight gain.

At one month, the proportion with adequate weight gain increased substantially to 80.9%.

Table 6: LATCH score and weight gain according to gestational age

Outcome	34 weeks + 6 days (N=65) n (%)	35 weeks + 6 days (N=132) n (%)	36 weeks + 6 days (N=201) n (%)	p-value
LATCH at first assessment: <5	31 (41.9)	32 (24.2)	26 (13.5)	<0.001
LATCH at first assessment: 6–7	35 (47.3)	65 (49.2)	102 (53.1)	
LATCH at first assessment: ≥8	8 (10.8)	35 (26.5)	64 (33.3)	
LATCH at discharge: <5	9 (12.2)	8 (6.1)	10 (5.2)	<0.001
LATCH at discharge: 6–7	48 (64.9)	52 (39.4)	52 (27.1)	
LATCH at discharge: ≥8	17 (23.0)	72 (54.5)	130 (67.7)	
LATCH at 1 month: <5	7 (9.5)	2 (1.5)	3 (1.6)	<0.001

LATCH at 1 month: 6–7	15 (20.3)	23 (17.4)	19 (9.9)	
LATCH at 1 month: ≥8	52 (70.2)	107 (81.1)	170 (88.5)	
Adequate weight gain at discharge	30 (41.6)	57 (43.2)	116 (60.8)	<0.001
Inadequate weight gain at discharge	44 (59.4)	75 (56.8)	76 (39.2)	
Adequate weight gain at 1 month	59 (79.5)	91 (81.3)	158 (82.3)	0.887
Inadequate weight gain at 1 month	15 (20.5)	21 (18.7)	34 (17.7)	

Lower LATCH scores were more frequent among babies born at earlier gestational ages. A poor LATCH score at the initial assessment was observed in 41.9% of 34-week babies, compared with 24.2% and 13.5% among 35- and 36-week babies, respectively. At one month, good LATCH scores were observed in 70.2%, 81.1% and 88.5% of the respective gestational age groups. The association between gestational age and LATCH score was statistically significant at all three assessment points. Weight gain at discharge also differed significantly between gestational age groups, whereas weight gain at one month did not show a statistically significant difference.

Table 7: Association between initiation of breastfeeding and LATCH score at first assessment

Initiation of breastfeeding	LATCH <5 n (%)	LATCH 6–7 n (%)	LATCH ≥8 n (%)	Total

≤1 hour	25 (14.5)	83 (48.3)	60 (37.2)	168
1–3 hours	29 (26.4)	52 (51.8)	20 (21.8)	101
3–6 hours	25 (27.2)	53 (57.3)	16 (15.5)	94
>6 hours	10 (32.5)	14 (37.8)	11 (29.7)	35
Total	89 (22.3)	202 (50.7)	107 (27.0)	398

p=0.001

There was a statistically significant association between the timing of breastfeeding initiation and the initial LATCH score. A good LATCH score was more frequently observed among neonates who initiated breastfeeding within one hour of birth.

Table 8: Indications for admission from postnatal wards

Indication for admission	Frequency (N=135)	Percentage (%)
Hyperbilirubinaemia	64	47.8
Hypoglycaemia	47	34.5
Neonatal sepsis*	16	11.7
Dehydration	8	6.0
Total	135	100

*Suspected and proven sepsis were included.

Among the 135 late preterm babies admitted from the postnatal wards, hyperbilirubinaemia was the most common indication for admission (47.8%), followed by hypoglycaemia (34.5%), neonatal sepsis (11.7%) and dehydration (6.0%).

Table 9. Age at admission and initiation of breastfeeding among admitted neonates

Parameter	Frequency (N=135)	Percentage (%)
Age at admission		

≤3 days	101	74.8
>4 days	34	25.2
Initiation of breastfeeding		
<1 hour	11	8.2
1–3 hours	39	28.8
3–6 hours	53	39.3
>6 hours	32	23.7

Most admitted late preterm babies (74.8%) were admitted within the first three days of life. Among admitted babies, breastfeeding was most commonly initiated between 3 and 6 hours of life (39.3%).

Table 10: Breastfeeding parameters and weight gain according to postnatal ward or admission status

Outcome	Postnatal ward (N=263) n (%)	Admitted (N=135) n (%)	p-value
LATCH at first assessment			<0.001
<5	46 (17.5)	43 (31.9)	
6–7	147 (55.9)	55 (40.7)	
≥8	66 (26.6)	37 (27.4)	
LATCH at discharge			<0.001
<5	12 (4.6)	15 (11.1)	
6–7	93 (35.4)	59 (43.7)	
≥8	158 (60.1)	61 (45.2)	
LATCH at 1 month			<0.001
<5	5 (1.9)	8 (5.9)	
6–7	32 (12.2)	34 (25.2)	
≥8	226 (85.9)	93 (68.9)	

Weight gain at discharge			0.524
Adequate	123 (46.8)	58 (43.0)	
Inadequate	140 (53.2)	77 (57.0)	
Weight gain at 1 month			0.203
Adequate	218 (82.9)	104 (77.0)	
Inadequate	45 (17.1)	31 (23.0)	

Neonates requiring admission had significantly poorer LATCH scores at the initial assessment, at discharge and at one month compared with neonates managed in the postnatal wards. However, there was no statistically significant difference in weight gain between the two groups at discharge or at one month.

The average duration of hospital stay was 9.3 days, with an average stay of 6.5 days among postnatal ward babies and 12.5 days among admitted babies.

Table 11: Association between initiation of breastfeeding and LATCH score at discharge

Initiation of breastfeeding	LATCH <5 n (%)	LATCH 6–7 n (%)	LATCH ≥8 n (%)	Total
≤1 hour	0 (0.0)	50 (29.8)	118 (70.2)	168
1–3 hours	5 (5.0)	26 (25.7)	70 (69.3)	101
3–6 hours	20 (21.2)	35 (37.3)	39 (41.5)	94
>6 hours	9 (25.8)	13 (37.1)	13 (37.1)	35
Total	34 (8.5)	124 (31.2)	240 (60.3)	398

p=0.001

At discharge, 60.3% of neonates had a good LATCH score (≥8). A good LATCH score was observed in 70.2%

of neonates who initiated breastfeeding within one hour, compared with 37.1% among those who initiated breastfeeding after six hours. The association between timing of breastfeeding initiation and LATCH score at discharge was statistically significant.

Table 12: Association of breastfeeding initiation with LATCH score and weight gain at one month

A. LATCH score at one month

Initiation of breastfeeding	LATCH <5 n (%)	LATCH 6–7 n (%)	LATCH ≥8 n (%)	Total
≤1 hour	0 (0.0)	12 (7.1)	156 (92.9)	168
1–3 hours	0 (0.0)	16 (15.8)	85 (84.2)	101
3–6 hours	5 (5.3)	28 (29.7)	61 (65.0)	94
>6 hours	5 (14.2)	8 (22.8)	22 (63.0)	35
Total	10 (2.5)	64 (16.0)	324 (81.4)	398

p=0.001

B. Weight gain at one month

Initiation of breastfeeding	Adequate n (%)	Inadequate n (%)	Total
≤1 hour	154 (91.7)	14 (8.3)	168
1–3 hours	88 (87.1)	13 (12.9)	101
3–6 hours	79 (84.0)	15 (26.0)*	94
>6 hours	18 (51.4)	17 (48.6)	35
Total	339 (85.1)	59 (14.9)	398

p=0.001

Discussion

The present descriptive observational study evaluated the initiation and progression of breastfeeding among late preterm babies born at a tertiary care hospital. A total of

422 late preterm babies were enrolled, of whom 398 were available for assessment at one month. The study demonstrated progressive improvement in breastfeeding effectiveness, as reflected by increasing LATCH scores, as well as improvement in weight gain during follow-up. Earlier initiation of breastfeeding was associated with better LATCH scores and better weight gain.

Late preterm infants represented 9.18% of all deliveries in the present study, and constituted 54.3% of all preterm births. The relatively high proportion of late preterm births is clinically relevant because these infants, despite appearing relatively mature, remain at increased risk of neonatal complications and feeding difficulties. Engle et al. described late preterm infants as physiologically and metabolically less mature than term infants and highlighted their increased susceptibility to neonatal morbidity.³

Initiation of breastfeeding

In the present study, 42.2% of late preterm babies initiated breastfeeding within the first hour of life, while 25.4% initiated breastfeeding within 1–3 hours. Thus, approximately two-thirds of the infants initiated breastfeeding within three hours of birth. However, 23.6% initiated feeding between 3 and 6 hours and 8.8% after 6 hours.

These findings are important because WHO recommends initiation of breastfeeding within the first hour after birth. Early initiation facilitates colostrum intake and is associated with improved breastfeeding outcomes.^{1,2} The relatively high proportion of babies initiating breastfeeding early in the present study may reflect the breastfeeding counselling and neonatal support provided in the study setting.

A prospective study of late preterm infants similarly demonstrated that early first latch-on and skin-to-skin

contact were more frequently associated with exclusive human milk feeding. [9] This supports the importance of early breastfeeding initiation as a potentially modifiable factor in establishing successful breastfeeding among late preterm infants.

Progression of LATCH score

A major finding of the present study was the progressive improvement in LATCH scores. At the initial assessment, only 26.9% of infants had a good LATCH score (≥ 8), whereas 50.8% had a fair score of 6–7 and 22.4% had a poor score of < 5 . At discharge, the proportion with a good LATCH score increased to 55.0%, and by one month it increased further to 80.2%.

This progressive improvement is biologically plausible because feeding skills mature with increasing postmenstrual age. The coordination of sucking, swallowing and respiration improves substantially during the late preterm period. Lau et al. demonstrated significant maturation of sucking efficiency and swallowing-respiratory coordination between approximately 33 and 36 weeks of postmenstrual age.⁵ Thus, the improvement observed in LATCH scores in the present study may reflect both physiological maturation and the effects of repeated breastfeeding practice and maternal counselling.

The LATCH system was originally developed as a structured method for assessing breastfeeding using five clinically relevant components. [10] Its use at multiple time points in the present study allowed objective documentation of the progression of breastfeeding rather than relying solely on subjective assessment.

Relationship between gestational age and breastfeeding

The present study demonstrated a significant relationship between gestational age and LATCH score. Infants born

at 34 weeks had poorer initial breastfeeding performance than those born at 35 and 36 weeks. A LATCH score < 5 was observed in 41.9% of infants in the 34-week group compared with 24.2% and 13.5% among the 35- and 36-week groups, respectively ($p < 0.001$).

A similar pattern was observed at discharge and one month. At one month, a good LATCH score (≥ 8) was observed in 70.2% of 34-week infants, compared with 81.1% of 35-week and 88.5% of 36-week infants. This finding suggests that increasing gestational age is associated with better breastfeeding competence, particularly during the early neonatal period.

The physiological basis for this finding is supported by studies demonstrating progressive maturation of sucking, swallowing and respiratory coordination with increasing postmenstrual age. [5,6] Late preterm infants born at the lower end of the gestational age spectrum therefore require closer monitoring and more intensive breastfeeding support.

Weight gain

Weight gain also improved considerably during follow-up. At discharge, adequate weight gain was observed in 45.5% of infants, increasing to 80.9% at one month. Weight gain at discharge differed significantly according to gestational age, with adequate weight gain observed in 41.6%, 43.2% and 60.8% of the 34-, 35- and 36-week groups, respectively.

However, by one month, the difference between gestational age groups was no longer statistically significant ($p = 0.887$). This suggests that although younger late preterm infants may have greater difficulty achieving adequate early weight gain, the difference may diminish with maturation, continued breastfeeding support and adequate nutritional intake.

Growth assessment is particularly important in preterm infants. The revised Fenton growth charts were developed using large population-based datasets and provide a standardized approach for assessing preterm growth in relation to gestational age.¹¹

Association between early breastfeeding initiation and LATCH score

The present study demonstrated a statistically significant association between the timing of breastfeeding initiation and LATCH score at the initial assessment ($p=0.001$). Among infants who initiated breastfeeding within one hour, 37.2% had a good LATCH score, compared with 21.8% among those initiating breastfeeding at 1–3 hours and 15.5% among those initiating at 3–6 hours.

A similar association persisted at discharge. Among babies who initiated breastfeeding within one hour, 70.2% had a LATCH score ≥ 8 at discharge, compared with only 37.1% among those who initiated breastfeeding after six hours. At one month, 92.9% of babies who initiated breastfeeding within one hour had a LATCH score ≥ 8 .

These findings suggest that early breastfeeding initiation may be associated with better subsequent breastfeeding performance. WHO recommendations emphasize early breastfeeding initiation and practical breastfeeding support, particularly for mothers experiencing difficulties establishing breastfeeding.^{1,2} The association observed in this study is also consistent with prospective evidence demonstrating better exclusive human milk feeding among late preterm infants with early first latch-on and skin-to-skin contact.⁹

However, because the present study was observational, the association should not be interpreted as proof that early initiation alone caused the improvement. Infants who are clinically more stable and developmentally more

mature may both initiate breastfeeding earlier and achieve better LATCH scores.

Late preterm infants requiring admission

In the present study, 135 late preterm babies required admission from the postnatal wards. Hyperbilirubinaemia was the most common indication for admission (47.8%), followed by hypoglycaemia (34.5%), neonatal sepsis (11.7%) and dehydration (6.0%).

These findings are consistent with the recognized vulnerability of late preterm infants to hyperbilirubinaemia, hypoglycaemia, feeding difficulties and dehydration. Adamkin emphasized that feeding problems are an important nutritional concern among late preterm infants, while other reviews have highlighted the increased risk of jaundice, hypoglycaemia, feeding problems and rehospitalization in this population.^{4,13}

The majority of admitted infants (74.8%) were admitted within the first three days of life. Breastfeeding among admitted infants was most commonly initiated between 3 and 6 hours of life (39.3%), while only 8.2% initiated breastfeeding within the first hour. This pattern indicates that late preterm infants requiring admission had greater challenges in establishing early breastfeeding.

Comparison of admitted and postnatal ward infants

The present study showed significantly poorer LATCH scores among admitted infants compared with those managed in the postnatal wards. At the initial assessment, a poor LATCH score (<5) was observed in 31.9% of admitted infants compared with 17.5% of postnatal ward infants ($p<0.001$). At one month, a good LATCH score was observed in 68.9% of admitted infants compared with 85.9% of postnatal ward infants.

This difference is clinically understandable because infants requiring admission are more likely to have medical problems that interfere with feeding. Late

preterm infants with hypoglycaemia, jaundice, suspected sepsis or other neonatal complications may have reduced feeding activity or may require separation from their mothers, potentially interfering with breastfeeding establishment.

Nevertheless, there was no statistically significant difference in weight gain between admitted and postnatal ward infants at discharge ($p=0.524$) or one month ($p=0.203$). Adequate weight gain at one month was observed in 77.0% of admitted infants and 82.9% of postnatal ward infants. This finding suggests that despite poorer initial breastfeeding performance, admitted infants can achieve satisfactory growth with appropriate feeding support and follow-up.

Breastfeeding and weight gain

The study also demonstrated a significant association between the timing of breastfeeding initiation and weight gain. At discharge, adequate weight gain was observed in 51.8% of infants who initiated breastfeeding within one hour, compared with 31.4% among those who initiated breastfeeding after six hours ($p=0.046$).

At one month, adequate weight gain was observed in 91.7% of infants who initiated breastfeeding within one hour, compared with 51.4% of those who initiated breastfeeding after six hours ($p=0.001$). These findings indicate that early breastfeeding initiation may be an important marker of successful feeding and subsequent growth.

The relationship is consistent with the biological importance of early establishment of breastfeeding and effective milk transfer. However, as with the LATCH findings, the observational nature of the study means that other factors, including gestational age, neonatal illness, birth weight and maternal factors, may contribute to the observed association.

Role of breastfeeding support

The improvement in LATCH scores observed in the present study may also reflect the structured counselling and breastfeeding support provided to mothers. Mothers were counselled regarding breastfeeding, maintenance of warmth and kangaroo mother care, while neonates admitted to the NICU were monitored regularly for feeding-related problems.

Evidence from systematic reviews indicates that direct healthcare support and provision of information to parents can improve breastfeeding initiation and continuation among moderate and late preterm infants.^{12,14} The Academy of Breastfeeding Medicine also emphasizes the need for individualized breastfeeding assessment and additional support for late preterm infants because of their increased risk of feeding difficulties.¹⁵

The WHO similarly recommends early initiation of breastfeeding, mother's own milk as the preferred feeding option for preterm and low-birth-weight infants, and kangaroo mother care as routine care for preterm or low-birth-weight infants.¹²

Conclusion

Late preterm infants demonstrated delayed breastfeeding establishment, particularly at lower gestational ages. Early initiation of breastfeeding was associated with better LATCH scores and improved weight gain. Breastfeeding skills improved substantially by discharge and one month, highlighting the importance of early initiation, skilled lactation support, regular LATCH assessment, and close follow-up, especially for infants born at 34–35 weeks and those requiring postnatal admission.

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