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ORIGINAL ARTICLE

Comparative Study of Breastfeeding in Caesarean Delivery and Vaginal Delivery Using LATCH Score and Maternal Serum Prolactin Level in Early Postpartum Period

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Abstract

Introduction Practice of starting and sustaining breastfeeding is affected by many conditions, mode of delivery is one of the major factor influencing it. Purpose of the study was to see if the mode of delivery affects the subsequent lactation in early postpartum period and to raise awareness among the community about the importance of mode of delivery in early initiation of breast feeding.

Materials and Methods Present study was a hospital based observational, comparative prospective study. A sample size of 120 subjects in each group (caesarean delivery CD Group and vaginal delivery VD group) was required. Serum prolactin and LATCH score both at 1st hour and 24th hour were compared in both groups.

Results Mean LATCH score at 1st hour and 24th hour of CD Group was 5.44 ± 0.68 and 7.12 ± 0.95, respectively. The mean LATCH score at 1st hour and 24th hour of VD Group was 7.12 ± 0.94 and 8.1 ± 1, respectively. Mean serum prolactin level at 1st hour and 24th hour of CD Group was 259.68 ± 33.99 and 309.99 ± 42.27, respectively. Mean serum prolactin level at 1st hour and 24th hour of VD Group was 304.91 ± 42.07 and 333.34 ± 42.65, respectively. The mothers delivered by caesarean had main problem with latch (*L*) and hold (*H*) of the baby as compared to mothers delivered vaginally.

Conclusion Mode of delivery has a direct impact on early initiation of breast feeding. Caesarean delivery is a cause for delay in initiation of breastfeeding.

Keywords Breastfeeding · Lactation · Caesarean delivery · Vaginal delivery · LATCH score · Prolactin

Introduction

Practice of starting and sustaining the breastfeeding is affected by many conditions. Lack of knowledge about the benefits of early initiation, requirement of external support to attach the baby to the breast and the mode of delivery are the major factors affecting breastfeeding [1].

Early initiation of breastfeeding means initiation of breast milk feeding within first hour of birth. Delayed initiation of breastfeeding increases the risk of neonatal sepsis and about 33% neonatal deaths can be averted if breastfeeding is initiated within an hour of birth. Late initiation of breast feeding leads to high neonatal morbidity and mortality [2].

In order to emphasize the importance of breastfeeding and in view of assisting the nursing mothers with the correct methodology, LATCH assessment tool was developed.

LATCH provides a systematic method for breastfeeding assessment and charting. It has standardized set of questions for gathering information; it is used to direct appropriate

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and timely interventions and to assist the new mother in establishing successful breastfeeding [3]

Latch Breastfeeding Assessment Score Tool [3]

LATCH evaluates breastfeeding and is represented as a visual scale similar to that of the APGAR system. This measurement tool has five evaluation criteria as follows: -

L: Latch on breast.
A: Audible swallowing.
T: Type of nipple.
C: Comfort breast/nipple.
H: Hold (self efficacy).

LATCH represents a simple, cost-effective tool capable of predicting breastfeeding as early as the first 24 h of life, especially in resource-limited settings [4].

Breastfeeding stimulates the production of naturally occurring hormones oxytocin and prolactin. Prolactin is required for milk secretion and oxytocin for milk let-down [5].

Prolactin has over 300 known biological activities; it plays a vital role in reproduction and homeostasis.Despite these many activities, the only recognized disorder associated with deficiency of prolactin secretion is the inability to lactate [6]

Suckling is a powerful stimulus to prolactin synthesis and secretion, and prolactin is necessary for milk secretion, [7] many researchers observed higher level of serum prolactin in vaginal delivery as compared to caesarean delivery [8, 9]. Caesarean delivery is one of the important causes for delay in initiating breastfeeding. Following caesarean delivery, unassisted mothers are often unable to hold their newborns in the recovery room [10], are less likely to have skin-to-skin contact immediately after birth and are more likely not to have attempted breastfeeding [11]. Previous studies show that mothers undergoing caesarean delivery and experiencing acute post caesarean pain have delayed onset of lactation as well. [12–14].

Purpose of the study was to see if the mode of delivery affects the subsequent lactation in early postpartum period and to raise awareness among the pregnant women and community about the importance of mode of delivery in early initiation of breast feeding.

In India, 41.5 percent children start breastfeeding within one hour of birth despite the fact that nearly 80 per cent of births take place in institutions. Hence, India should monitor and prioritize breastfeeding practices [15].

Materials and Methods

Present study is a hospital based observational, comparative prospective study which was conducted in the Department of Obstetrics and Gynaecology, SMS Medical College and Hospital, Jaipur from May 2020 to April 2021. Sample size was calculated at 80% study power and in the alpha error of 0.05, assuming standard deviation of 1.96% and confidence interval of 95%. A sample size of 120 subjects was required in each group which was increased to 130 subjects in each group considering withdrawal of consent/non response/attrition.

The study was conducted in women who were in their early postpartum period (at 1st hour and upto 24th hour) fulfilling the inclusion and exclusion criteria. Inclusion criteria were para two women (having experience of breast feeding in previous delivery) with singleton viable pregnancy of gestational age ≥ 37 wks, delivered by elective uncomplicated caesarean delivery or normal vaginal delivery with APGAR score of baby ≥ 7 at 5 min and baby shifted to mother within first hour. Exclusion criteria were high risk pregnancies, instrumental deliveries, mothers in whom breastfeeding is contraindicated and baby having any physical or medical problem which hampers breastfeeding. We selected first 120 women in each study group who delivered in our hospital during the study period by convenience sampling after fulfilling inclusion and exclusion criteria. The groups were: -

- CD Group (n = 120): women who delivered by caesarean section.
- VD Group (n = 120): women who delivered by vaginal route.

All caesarean section were done under regional anesthesia (SAB) and subjected to receive two doses of antenatal corticosteroid (if caesarean section done before 39 week of gestation). Baby condition was noted just after delivery. 3 ml of venous blood sample of mother at 1st hr and 24th hr after delivery was collected in a labelled plain vial. The serum was separated from the blood sample. PRL estimation of the serum was done by prolactin Enzyme Immunoassay. LATCH Breastfeeding Assessment Tool was used to determine breastfeeding success in both the groups. Data analysis- Data were entered in excel sheet. Continuous data were summarised in form of mean and standard deviation. Difference in mean was analysed using student 't' test on sub Group analysis. Discrete data were expressed in form of proportions and difference in proportions was analysed using chi-square test. The level of significance was kept at 95% for all statistical analysis Table 1.

Table 1 Breastfeeding Charting system (LATCH) [3]

LATCH	0	1	2	TOTAL
L LATCH	Too sleepy or reluctant No latch OR suck achieved	Repeated attempts for sustained latch and suck Hold nipple in mouth stimulate to suck	Grasps breast Tongue down Lips flanged Rhythmic sucking	
A AUDIBLE SWALLOWING	None	A few with stimulation	Spontaneous and intermittent < 24 h old Spontaneous and frequent > 24 h old	
T TYPE OF NIPPLE	Inverted	Flat	Everted (after stimulation)	
C COMFORT (BREAST-NIPPLE)	Engorged Cracked, bleeding, large severe discomfort, blisters, or bruises	Filling Reddened/small blisters or bruises Mild/moderate discomfort	Soft Non-tender	
H HOLD (POSITIONING)	Full assist (staff holds)	Minimal assist (elevate head of bed; place pillows) Teach one side; mother does other Staff holds and then mother takes over	No assist from staff Mother able to position/hold infant	

Results

Table 2 Baseline characteristics of women with caesarean delivery (CD Group) and vaginal delivery (VD Group)-

Baseline characteristics	CD Group	VD Group	*p*-value
Maternal age	26.78 ± 4.04	26.38 ± 3.69	0.424
Residence			
Rural	36 (30)	46 (38.3)	0.221
Urban	84 (70)	74 (61.7)	
Socioeconomic class			
Upper	11 (9.2)	7 (5.8)	0.569
Upper Middle	16 (13.3)	13 (10.8)	
Lower middle	58 (48.3)	54 (45)	
Upper Lower	24 (20)	30 (25)	
Lower	11 (9.2)	16 (13.3)	
Educational Status			
Illiterate	10 (8.3)	13 (10.8)	0.530
Primary School	30 (25)	40 (33.3)	
10th Class Pass	30 (25)	35 (29.2)	
12th Class Pass	27 (22.5)	19 (15.8)	
Graduate	23 (19.2)	13 (10.8)	
Mean period of gestation (POG)	38.97 ± 0.81	39.42 ± 1.08	< 0.001

The baseline characteristics of the whole study cohort are given in Table 2. Mean age of participants of CD Group was 26.78 ± 4.04 years, mean age of participants of VD Group was 26.38 ± 3.69 years. There was no significant difference between the participants of both the groups in terms of age (p-value = 0.424), resident area (p-value = 0.221), socioeconomic status (p-value = 0.569), education (p-value = 0.530), gender of the baby (p-value = 0.897), baby weight (p-value = 0.652) and APGAR score at 5 min (p-value = 0.675). Caesarean section group (CD Group) had higher educational and socioeconomic status. Mean period of gestation (POG) of participants of CD Group was 38.97 ± 0.81 weeks, mean POG of participants of VD Group was 39.42 ± 1.08 weeks. Caesarean delivery was done at an earlier age of gestation as compared to normal delivery.

Mean LATCH score at 1st hour and 24th hour of participants of CD Group was 5.44 ± 0.68 and 7.12 ± 0.95, respectively. The Mean LATCH score at 1st hour and 24th hour of participants of VD Group was 7.12 ± 0.94 and 8.1 ± 1, respectively. We observed higher LATCH scores in patients delivered via the vaginal route at 1st hour as well as at 24th hour. Mean serum prolactin level at 1st hour and 24th hour of participants of CD Group was 259.68 ± 33.99 and 309.99 ± 42.27, respectively. The mean serum prolactin level at 1st hour and 24th hour of participants of VD Group

Table 3 variable for comparison of lactational effect in caesarean delivery and vaginal delivery group

Variables	CD Group	VD Group	*p*-value
Sex of the baby			
Female	54 (45)	52 (43.3)	0.897
Male	66 (55)	68 (56.7)	
Mean weight of baby (kg)	2.83 ± 0.31	2.85 ± 0.34	0.652
Mean APGAR score at 5 min	8 ± 0.76	8.07 ± 0.73	0.488
Mean LATCH score at 1st hr	5.44 ± 0.68	7.12 ± 0.94	*p*-value < 0.001
Mean LATCH score at 24th hr	7.12 ± 0.95	8.1 ± 1	*p*-value < 0.001
Change in LATCH score (from 1st hr to 24th hr)	1.68 ± 0.77	0.98 ± 0.66	*p*-value < 0.001
S.prolactin at 1st hr (ng/ml)	259.68 ± 33.99	304.91 ± 42.07	< 0.001
S.prolactin at 24th hr (ng/ml)	309.99 ± 42.27	333.34 ± 42.65	< 0.001
Change in S.prolactin level (from 1st hr to 24th hr in ng/ml)	50.31 ± 23.66	28.43 ± 25.00	< 0.001

Table 4 Mean distribution of point recorded by study participants at 1st hr according to the LATCH charting system (L1 A1 T1 C1 H1)

LATCH score component at 1st hr	CD Group	VD Group	Test of significance
L	1	1.42 ± 0.5	$t = 9.220$, df = 238, p value < 0.001
A	0.49 ± 0.61	1.30 ± 0.71	$t = 9.830$, df = 238, p value < 0.001
T	2	2	
C	1.88 ± 0.33	1.95 ± 0.22	$t = 1.933$,df = 238, p value = 0.540
H	0.08 ± 0.26	0.42 ± 0.5	$t = 6.668$, df = 238, p value < 0.001

was 304.91 ± 42.07 and 333.34 ± 42.65, respectively. We observed higher serum prolactin level in patients delivered via the vaginal route at 1st hour as well as at 24th hour.

Mean change in LATCH score from 1st hr to 24th hr in participants of CD Group was 1.68 ± 0.77 which was higher than participants of VD Group (0.98 ± 0.66). The route of delivery has a great impact on LATCH scores in the early postnatal period especially in 1st hour of delivery, but this impact weakens over time; still the impact is significant up to 24th hour of delivery. (Shows in Table 3).

At 1st hour, women who had undergone C-section had lower mean L1, A1 and H1 score as compared to women who had undergone vaginal delivery. At 24th hour, women who had undergone C-section had lower mean L2,C2 and H2 score as compared to women who had undergone vaginal delivery, these differences were in favour of vaginal delivery. The mothers delivered by caesarean had main problem with latch (L) and hold (H) of the baby as compared to mothers delivered vaginally (Tables 4 and 5). A positive correlation of serum prolactin level at 1st hour and 24th hour with LATCH at 1st hour and 24th hour was found in both the groups. (Shows in Table 6).

Discussion

Breastfeeding is a mother's gift to herself, her baby, and the mankind. In our study, we evaluated the role of serum prolactin and applied LATCH assessment score tool for comparison of early postpartum lactation effects in both groups. There was a higher LATCH score in vaginal delivery group as compared to caesarean delivery group which indicates higher self efficacy of breastfeeding in mothers delivered vaginally. Fadiloglu E et al. (2020) [16], found higher LATCH scores in patients delivered via the vaginal route. They observed significant difference (p < 0.001) in the

Table 5 Mean distribution of point recorded by study participants at 24th hr according to the LATCH charting system (L2 A2 T2 C2 H2)

LATCH score component at 24th hr	CD Group	VD Group	Test of significance
L	1.39 ± 0.49	1.71 ± 0.46	$t = 5.179$, df = 238, p value < 0.001
A	1.28 ± 0.57	1.31 ± 0.46	$t = 0.374$, df = 238, p value = 0.079
T	2	2	
C	1.97 ± 0.18	2	$t = 2.026$, df = 238, p value = 0.044
H	0.48 ± 0.5	1.08 ± 0.62	$t = 8.384$, df = 238, p value < 0.001

Table 6 Correlation of serum prolactin and LATCH score in both the groups

Variables	Serum prolactin at 1st hour		Serum prolactin at 24th hour	
	Pearson's coefficient	*p* value	Pearson's coefficient	*p* value
Caesarean delivery Group				
LATCH at 1st hr	0.528	< 0.001	0.339	< 0.001
Latch at 24th hr	0.562	< 0.001	0.543	< 0.001
Vaginal delivery Group				
LATCH at 1st hr	0.575	< 0.001	0.42	< 0.001
Latch at 24th hr	0.654	< 0.001	0.548	< 0.001

mean LATCH score at 1st hour and 24th hour of caesarean delivery and normal delivery which was coherent with our results. Our result was coherent with the result observed by Cakmak H et al. (2007) [1] which stated that the average LATCH score for the first and second breastfeeding was 6.27 ± 1.51 and 7.80 ± 0.91 in CD mothers and 7.64 ± 0.97 and 8.70 ± 0.82 in VD mothers, respectively.

Change in LATCH score from 1st hour to 24th hour in participants of CD Group was 1.68 ± 0.77 which was higher than participants of VD Group (0.98 ± 0.66). In our study, the change in LATCH score was similar with the change observed by Fadiloglu E et al. (2020) [16] in caesarean section group (LATCH score increased by1) and this change is statistically significant. They conclude the same finding that the route of delivery has a great impact on LATCH scores in the early postnatal period, but this impact weakens over time.

Present study found higher serum prolactin level in patients delivered via the vaginal route at 1st hour as well as at 24th hour. In our study, mean serum prolactin level at 1st hour in participants of CD Group and VD Group was 259.68 ± 33.99 and 304.91 ± 42.07 respectively and mean serum prolactin level at 24th hour in participants of CD Group and VD Group was and 309.99 ± 42.27 and 333.34 ± 42.65 respectively. Difference in mean serum prolactin level at 1st hour and 24th hour in participants of each group was found to be statistically significant (p value < 0.05). Similar results were obtained by Isik Y et al. (2016) [8], they observed higher level of serum prolactin in women having normal delivery (284.84 ± 119.22) as compared to women undergoing caesarean section (295.95 ± 106.81).

In our study, the mean change in serum prolactin from 1st hour to 24th hour in participants of CD Group was 50.31 ± 23.66 and the mean change in serum prolactin from 1st hour to 24th hour in participants of VD Group was 28.43 ± 25.00. Erickson EN et al. (2020) [17] studied various hormones in breastfeeding mothers and observed that change in prolactin level was 26.2 ± 57.7 from start of feeding (311.81 ± 113.6) to 20 min later (340.0 ± 106.2). In our study, similar increase in prolactin level was observed in VD Group, although CD Group had higher increased level of prolactin than VD Group.

In our study, we observed that the mothers undergoing caesarean section had main problem with latch (*L*) and hold (H) of the baby at 1st hour and at 24th hour of postpartum period. Cakmak H et al. (2007) [1] observed significant difference at the level of A1, T1 and H1 level in 1st breastfeeding session and L2, A2 and H2 level in second breastfeeding session. The mothers undergoing caesarean section had main problem with latch (*L*) and hold (*H*) of the baby at 1st hour of postpartum period. In caesarean delivery, the patients were in operation theatre where they were under effect of anesthetic drugs so they were not able to hold (*H*) the baby and initiate latching. Maternal pain also interfered with their ability to hold and breastfeed. Heck KE et al. (2003) [18] observed that mothers delivering by caesarean were unable to offer their babies a satisfactory breastfeeding position (*H*) because of their discomfort. In addition, they tend to initiate breastfeeding at a later time due to the effect of anesthetic medications.

Similar results were observed by Babazade R et al. (2020) [19] they observed that in caesarean delivery the baby inspite of having normal APGAR score did not attempt Latch (L) in their hospital stay. Additionally they found the reason for this was the pain experienced by caesarean mothers. In their study they found the pain score is negatively associated with the LATCH score; higher pain was associated with lower LATCH scores in CD. Studied done by Albokhary AA et al. (2014) [20] observed that the mothers who had caesarean section stated that pain interfered with their ability to hold (H), breastfeed, and care for their baby. The probability of delayed initiation of breastfeeding (> 24 h) was found to be 12 times more likely when the birthing method was by caesarean section as opposed to vaginal birth. Since our cases were operated under regional anesthesia, drug factor was not a problem but owing to decreased sensation in both the lower limbs after caesarean specially during 1st hour the mother was not able to maintain proper position to hold (H) the baby independently and required assistance to latch the baby, this resulted in decrease in LATCH score in CD group. Some researchers found that pain was associated with lower

LATCH score in mothers delivered by caesarean section but routine pre-operative counselling to mentally prepare the women and effective analgesics can help in ameliorating the pain factor.

In our study, we found there was a positive correlation of serum prolactin at 1st hour and 24th hour with LATCH at 1st hour and 24th hour in both the groups. As serum prolactin level increased LATCH score improved and vice versa. Similar result was observed by Huang SK et al. (2020) [21], they observed prolactin levels by dividing participants into the low frequency breastfeeding group (Group I) and high frequency breastfeeding group (group II). They found that the mean basal serum PRL level was significantly greater in Group II than in Group I. The basal serum PRL level positively correlated with the number of episodes of suckling ($r = 0.6$, $p < 0.05$).

Conclusion

Mode of delivery has a direct impact on early initiation of breast feeding. Elective caesarean delivery was associated with lower LATCH score and lower serum prolactin level, in early postpartum period especially during 1st hr as compared to vaginal delivery. We should develop appropriate strategies to reduce the CS rate in our region. Additional guidance for mothers and their families is necessary to achieve better breastfeeding outcomes and her technique should be monitored and evaluated.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest and there is no violation of human rights.

Ethical Approval The study received approval from the institutional ethics committee with permission No. 451/MC/EC/2021 dated March 21, 2021. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Informed consent Written informed consent was obtained from the study participants.

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