

## Impact of Oxytocin on Latch Score and Correlation of Latch Score with Breast Feeding Self Efficacy Scale at a Tertiary Care Referral Unit in South India: A Prospective Cohort Study

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### Abstract

*Context:* Assessment of breast feeding efficiency and impact of drugs used during labor is essential to increase success of breast feeding. *Aims:* To study impact of Oxytocin on LATCH scores, prediction of exclusive breast feeding at 6 weeks using LATCH scores and find out correlation between LATCH score and breastfeeding self efficacy scale (BSES-SF). *Settings and Design:* Prospective cohort study conducted at Mehta multispecialty hospitals, Chennai. *Methods and Material:* 50 mother infant dyads receiving Oxytocin compared to 50 mother infant dyads who did not receive. LATCH scores assessed at birth, 48hrs/discharge and 6 weeks along with BSES-SF print outs given to all mothers. *Statistical analysis used:* LATCH and BSES-SF expressed as Mean. Chi-Square test and comparison of means used. Pearson correlation coefficient used to correlate LATCH and BSES-SF. Sensitivity and specificity along with a cutoff of LATCH score that predicts exclusive breastfeeding at 6 weeks calculated. *Results:* Mean LATCH scores at birth and 48hrs/discharge significantly low in Oxytocin group ( $p = 0.0003$  and  $0.0035$  respectively). LATCH score  $\geq 8$  at birth and  $\geq 9$  at 48hrs/discharge had highest sensitivity and specificity in NVD group. LATCH score  $\geq 7$  at birth and  $\geq 8$  at 48hrs/discharge had highest sensitivity and specificity in Oxytocin group. Positive linear correlation between LATCH and BSES-SF at 48 hrs and 6 weeks (NVD -  $r$  value 0.77, 0.77 and Oxytocin -  $r$  value 0.76, 0.76). *Conclusions:* Use of Oxytocin during labor is associated with poor LATCH scores. LATCH tool assessed in the first days of life can predict exclusive breastfeeding at 6 weeks postpartum. There is a positive linear correlation between LATCH score and BSES-SF.

**Keywords:** Breast Feeding Prediction; Breastfeeding Self Efficacy; LATCH Score and Oxytocin.

### Introduction

The use of drugs such as Oxytocin for either induction or augmentation of the labor has become increasingly common in the recent times [1]. Exogenous Oxytocin can interfere with breastfeeding in the early postpartum period, potentially having an adverse effect on long-term breastfeeding success and thus the overall health of the mother and infant [2]. Exogenous oxytocin may cause desensitization or down regulation of Oxytocin receptors. This could impact breastfeeding after birth by inhibiting the

oxytocin-induced milk ejection reflex. Oxytocin can have anti-diuretic effects on the mother, potentially leading to breast engorgement which interferes with breastfeeding by making it more difficult for the breast to conform to the baby's mouth and for the baby to adequately latch on to the breast [3] which can have a negative impact on breastfeeding. Oxytocin could impact breastfeeding success as it can increase the stress felt by the mother during labor [4].

LATCH is a tool based on observations and descriptions of effective breastfeeding which include five characteristics of breastfeeding [5]. The LATCH

score is a 10 point measure based on five dimensions of breastfeeding: infant latch (L), audible swallowing (A), type of nipple (T), comfort of breast/nipple (C), and hold/positioning (H) [6]. LATCH scores have been found to be associated with breastfeeding duration [7] and used in hospitals and birth centres to identify dyads that need more assistance to establish successful breastfeeding.

Maternal breastfeeding self-efficacy has been highlighted as an important psychometric factor for improving breastfeeding outcomes [8]. Breastfeeding self-efficacy is defined as a mother's confidence in her ability to breastfeed her new infant [9] and has been positively associated with breastfeeding duration and exclusivity in various cultures and age groups. Breastfeeding Self Efficacy Scale-Short Form (BSES-SF) [10], a 14-item, self report instrument developed to assess breastfeeding self-efficacy.

The promotion and support of breastfeeding is a global priority and an important child-survival intervention [11] and assessment of breast feeding efficiency by subjective and objective means and impact of drugs used during labor is essential to increase success of breast feeding. India should monitor and prioritize breast feeding practices to improve breast feeding rates, says a recent report from the World Breastfeeding Trends Initiative (WBTi) [12]. In 2015 India scored 78/150 in the WBTi's assessment of 15 factors in "policy and programmes" and "infant and young child feeding" – only a small improvement from 68/150 in 2005. Helping mothers breastfeed also entails assessing the latch on to the breast because this aspect is strongly related to the success of breastfeeding [13,14].

Therefore, health professionals need reliable, reproducible tools to assess the effectiveness of the feed and to identify mother-infant pairs who need extra support and follow-up. Hence we decided to study whether oxytocin used during labor has an impact on LATCH score and find out correlation between breast feeding assessment tools LATCH score and BSES-SF and whether a good LATCH score at birth predicts exclusive breast feeding at 6 weeks postpartum. We also tried to find out an optimum cut-off for LATCH score that can predict exclusive breastfeeding at 6 weeks postpartum.

## Materials and Methods

*Design:* A prospective cohort study

*Setting:* Study was conducted by the Department of Neonatology at Mehta Multispecialty hospital,

Chennai from January 2016 to June 2016 after approval from the Institute Ethics committee.

### *Sample*

All the pregnant mothers who underwent vaginal delivery during the study period were included into our study along with their infants after consent. The mother infant dyads were divided into 2 groups (NVD and Oxytocin) based on whether exogenous Oxytocin was used to augment or induce the labor or not. Oxytocin administration during labor induction was performed as indicated by the obstetrician: infusion of 10 units of oxytocin added to a 500mL bag of physiologic saline (0.9% NaCl) solution. Administration of 2 mIU was initiated, and the dose was doubled every 15 minutes until at least three contractions were achieved in 10 minutes, up to a maximum of 40 mIU. The final dose of oxytocin administered was recorded by the midwives conducting the delivery. All mothers received oxytocin after the delivery for preventing bleeding in the third stage of the labor. Singleton births and babies with gestational age  $\geq 37$  weeks were included into our study. Babies with APGAR score  $<7$  at 5 minutes of life, babies who were sick requiring NICU admission and mothers who were sick and unable to breastfeed were excluded from our study. None of the mothers received epidural analgesia.

### *Measurement*

LATCH score and BSES-SF handouts were the study tools used. The LATCH charting system assigns a numerical score (0, 1, or 2) to five key breastfeeding components identified by the letters of the acronym LATCH as explained earlier. The total score ranges from 0 to 10, with the higher score representing successful breastfeeding. An international board certified lactation consultant trained the labor delivery room and postpartum nurses in the use of LATCH tool. After giving birth, mother and baby stayed in the labor delivery room for 1 hour. During this period, breastfeeding and skin-to-skin contact were attempted. The time given for the baby to LATCH was 10 minutes. The staff nurse assessed the LATCH score for each mother infant dyad at birth, 48hrs/discharge and 6 weeks postpartum in both the groups. LATCH assessment tool with individual scores was attached in the case sheets. All the mothers in both the groups were given the breast feeding self efficacy scale short form (BSES-SF) handouts at 48 hrs/discharge and 6 weeks. All items in BSES-SF are anchored with a 5-point Likert-type scale where 1 = not at all confident and 5 = very confident. Items are presented positively

and summed to produce a total score ranging from 14 to 70, with higher scores indicating higher levels of breastfeeding self-efficacy. Mothers were encouraged to fill the handouts which were attached to the case sheets for documentation purpose. Data were collected on the following variables: maternal age, gravidity, parity, socioeconomic status, type of family, place of residence, antenatal breastfeeding counselling, marital life, breast examination and family support. For the newborn, birth weight, sex, gestational age, and 1-minute and 5-minute Apgar scores were recorded. These baseline variables were compared between NVD and Oxytocin groups. Grading of LATCH score (Table 1) and BSES-SF (Table 2) was done and compared in both the groups. Based on definitions developed by Labbok and Krasovec [15], exclusive breast feeding that is no other liquid or solid given to the baby was taken as “breastfeeding” and partial, token and none was taken as “not breastfeeding” at 6 weeks.

#### Statistical Analysis

Baseline and outcome data were recorded in a predesigned proforma and master chart was prepared in Microsoft Excel sheet. Chi square test for categorical variables, Wilcoxon’s test for continuous variables not distributed normally and student t test for continuous variables distributed normally were employed. Comparison of means and proportions used wherever appropriate in both the groups. Association of good LATCH score at birth and 48hrs/ discharge with exclusive breastfeeding status at 6 weeks in both the groups studied. Sensitivity and specificity of all possible LATCH score thresholds

for predicting breastfeeding at 6 weeks in both groups studied (Table 3). Sensitivity is the ability of a LATCH score at or above the threshold to predict whether a subject will be breastfeeding at 6 weeks. Specificity, in this study, is the ability of a low LATCH score to predict that a participant will no longer be breastfeeding at 6 weeks. The relative risk (RR) of LATCH score to breastfeeding at 6 weeks, along with accompanying 95% confidence intervals, was then computed for that cut-off point. The correlation between LATCH scores and BSES-SF scales was assessed by Pearson correlation coefficient. P values 0.05 or less were considered statistically significant.

### Results

During the study period, 120 normal deliveries took place at our hospital of which 55 received Oxytocin and 65 did not receive Oxytocin. Out of the 55 mother infant dyads in Oxytocin group 5 were lost to 6 weeks follow up. Out of the 65 normal deliveries, 7 were not interested in participation in the study and 8 mother infant dyads were lost to follow up (Figure 1). Hence 50 mother infant dyads in each group included in the final analysis. Baseline characteristics in both the groups were comparable (Table 4). The mean LATCH scores at birth, 48hrs/ discharge and at 6 weeks were significantly lower in Oxytocin group compared to NVD group (P value - 0.0003, 0.0035 and 0.046 respectively) (Table 5). Mean BSES-SF scores were significantly lower in Oxytocin group compared to NVD group at 48 hrs and 6 weeks (P value - 0.0002 and 0.0057 respectively) (Table 5). However the rate of exclusive breastfeeding at 6 weeks was not

**Table 1:** Grading of LATCH score

Grading	LATCH Score
Good	8 - 10
Moderate	4 - 7
Poor	0 - 3

**Table 2:** Grading of BSES-SF

Grading	BSES - SF score
High	52 - 70
Moderate	33 - 51
Low	14 - 32

**Table 3:** Calculating sensitivity and specificity

LATCH result	Breastfeeding at 6 weeks	Weaned	Total
At or above threshold	a	b	a + b
Below threshold	c	d	c + d
Total	a + c	b + d	a + b + c + d

**Table 4:** Baseline characteristics in both the groups

Characteristic	NVD Group	OXYTOCIN Group	P Value
Maternal age (yrs)	29.84 (3.05)	29.08 (3.42)	0.24
Place of residence (%)			0.46
Urban	82	66	
Rural	18	34	
Type of family (%)			0.18
Joint	22	34	
Nuclear	78	66	
Socioeconomic status (%)			0.39
Upper	14	20	
Upper middle	78	56	
Lower middle	8	24	
Antenatal counseling	42%	38%	0.68
Primigravidae	68%	62%	0.52
Abnormal breast examination	22%	18%	0.62
Family support	68%	76%	0.38
Marital life (yrs)	3.74 (2.84)	3.22 (2.57)	0.34
Gestational age (wks)	38.68 (0.96)	38.54 (1.14)	0.5
APGAR at 5 minutes	10 (9,10)	10 (10, 10)	0.06
Birth weight (kg)	2.96 (0.35)	3.068 (0.4)	0.15
Male babies	50%	58%	0.42

**Table 5:** Comparison of outcome variables in both the groups

Characteristic	NVD Group	OXYTOCIN Group	P Value	Relative Risk /Risk Difference (95% CI)
LATCH score at birth	6.76 (1.61)	5.38 (2.07)	0.0003	-1.38 (-2.11 to -0.64)
LATCH score at 48hrs/ discharge	8.5 (1.66)	7.34 (2.18)	0.0035	-1.16 (-1.92 to -0.39)
LATCH score at 6 weeks	9.18 (1.52)	8.56 (1.55)	0.046	-0.62 (-1.23 to -0.01)
BSES-SF at 48hrs/ discharge	48.74 (9.49)	39.32 (14.65)	0.0002	-9.42 (-14.32 to -4.52)
BSES-SF at 6 weeks	61.52 (13.24)	53.56 (14.88)	0.0057	-7.96 (-13.55 to -2.37)
EBF at 6 weeks	66%	58%	0.52	8 (-17.78 to 33.03)
LATCH score at birth in those EBF at 6 weeks	7.52 (0.9)	6.79 (1.26)	0.01	-0.73 (-1.28 to -0.17)
LATCH score at 48hrs/ discharge in those EBF at 6 weeks	9.52 (0.79)	8.89 (1.14)	0.013	-0.63 (-1.12 to -0.14)

**Table 6:** Predicting breastfeeding at 6 weeks using LATCH scores in NVD group

Latch score at time period	Cut off	Sensitivity	Specificity	RR (CI)	P VALUE
Birth	≥6	75%	100%	2.54 (1.6 to 4.03)	0.0001
	≥7	89.66%	66.67%		
	≥8	100%	60.71%		
	≥9	100%	35.42%		
At 48 hrs	≥6	70.21%	100%	3.83 (1.93 to 7.63)	0.0001
	≥7	78.57%	100%		
	≥8	91.67%	100%		
	≥9	100%	73.91%		

**Table 7:** Predicting breastfeeding at 6 weeks using LATCH scores in OXYTOCIN group

Latch score at time period	Cut off	Sensitivity	Specificity	RR (CI)	P VALUE
Birth	≥6	92.59%	82.61%	2.9 (1.8 to 4.7)	<0.0001
	≥7	100%	65.62%		

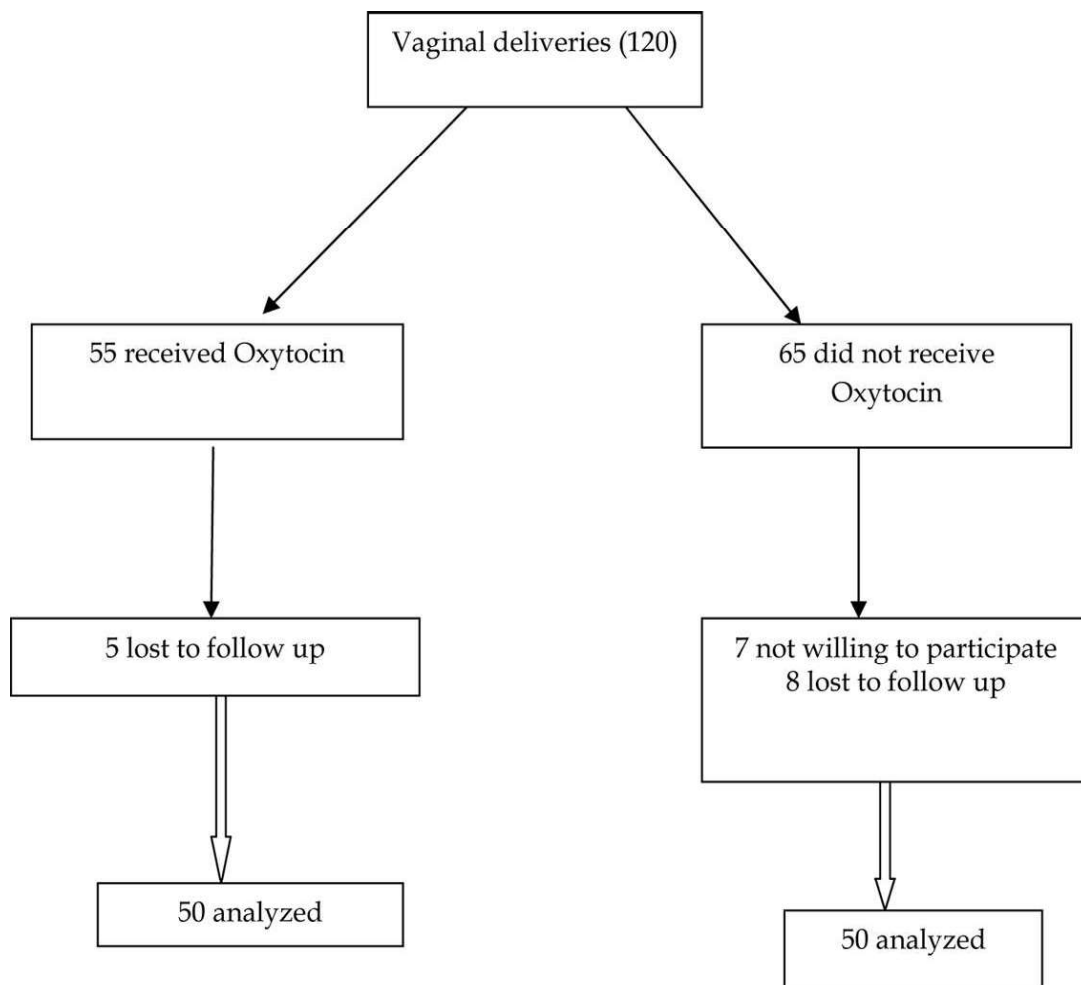
At 48 hrs	≥8	100%	52.5%	6.25 (2.54 to 15.34)	0.0001
	≥9	100%	42.86%		
	≥6				
	≥7	93.55%	100%		
	≥8	100%	84%		
	≥9	100%	63.64%		

**Table 8:** Correlation of LATCH score and BSES-SF in NVD group

Scale at 48hrs	N	Mean (SD)	Minimum	Maximum	r	P value
LATCH	50	8.55 (1.6)	5	10	0.7761	<0.00001
BSES-SF	50	48.74 (9.49)	29	61		
Scale at 6 weeks					0.7723	<0.00001
LATCH	50	9.18 (1.52)	4	10		
BSES-SF	50	61.52 (13.24)	26	70		

**Table 9:** Correlation of LATCH score and BSES-SF in OXYTOCIN group

Scale at 48 hrs	N	Mean (SD)	Minimum	Maximum	r	P value
LATCH	50	7.34 (2.18)	3	10	0.7669	<0.00001
BSES-SF	50	39.32 (14.65)	14	60		
Scale at 6 weeks					0.7663	<0.00001
LATCH	50	8.56 (1.55)	4	10		
BSES-SF	50	53.56 (14.88)	30	70		



**Fig. 1:** Data collection and Analysis

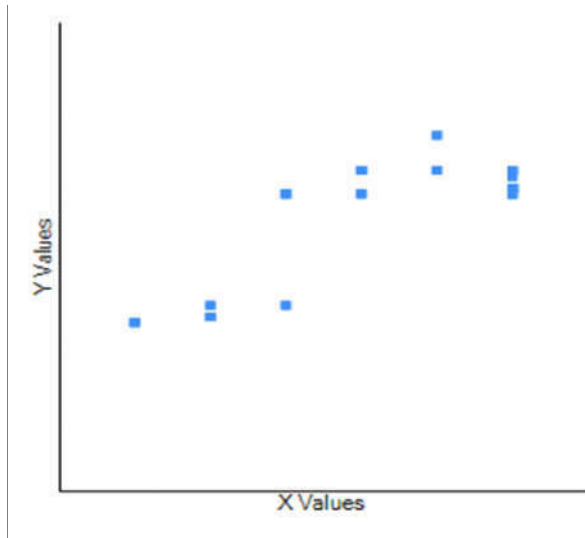


Fig. 2: Scatter plot for LATCH score (X axis) and BSES-SF (Y axis) at 48hrs/discharge in NVD group ( $r = 0.7761$ )

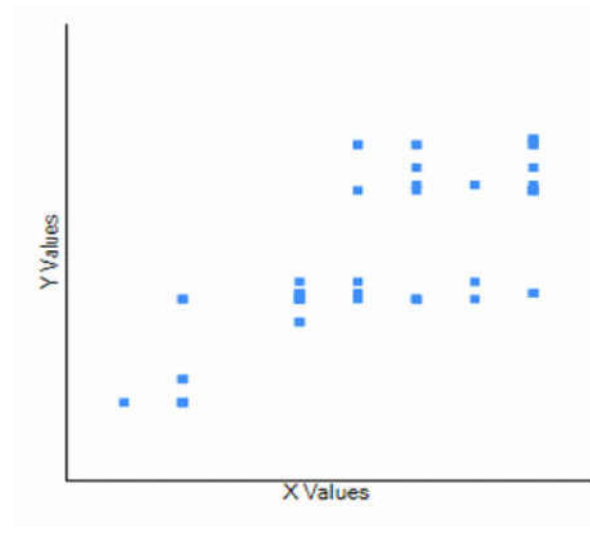


Fig. 4: Scatter plot for LATCH score (X axis) and BSES-SF (Y axis) at 48hrs/discharge in OXYTOCIN group ( $r = 0.7669$ )

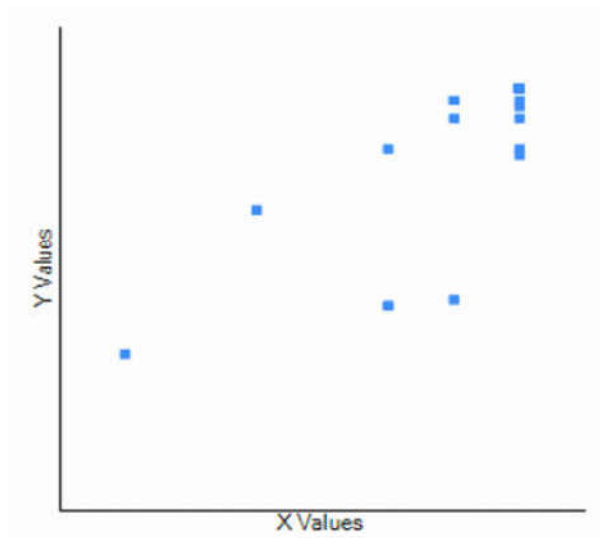


Fig. 3: Scatter plot for LATCH score (X axis) and BSES-SF (Y axis) at 6 weeks in NVD group ( $r = 0.7723$ )

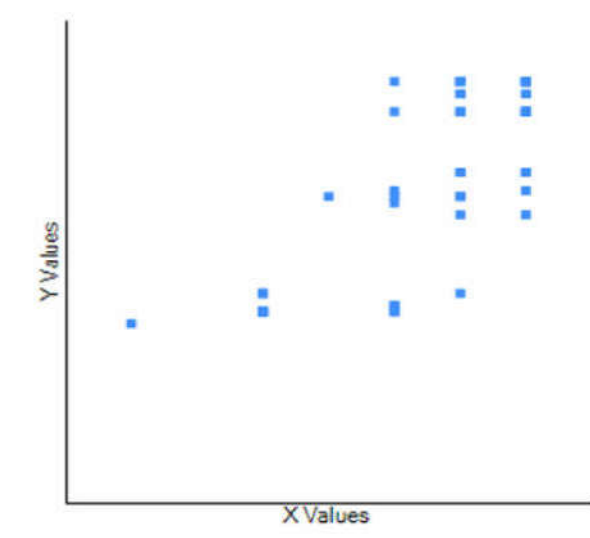


Fig. 5: Scatter plot for LATCH score (X axis) and BSES-SF (Y axis) at 6 weeks in OXYTOCIN group ( $r = 0.7663$ )

significantly different in NVD and Oxytocin groups ( $P$  value - 0.52) (Table 5). Mean LATCH score at birth and 48hrs/ discharge in women exclusively breastfeeding at 6 weeks was significantly higher in NVD group ( $P$  value - 0.01 and 0.013 respectively) (Table 5). The sensitivity and specificity of different cut-offs of LATCH scores at birth and 48hrs/ discharge in NVD group shown in Table 6. Highest sensitivity (100%) and specificity (60.71%) was noted for a latch score  $\geq 8$  at birth in NVD group. The RR of a LATCH score of 8 or more at birth was 2.54 (1.6 to 4.03,  $P = 0.0001$ ). Highest sensitivity (100%) and specificity (73.91%) was noted for a latch score  $\geq 9$  at 48hrs/ discharge in NVD group. The RR of a LATCH score of 9 or more at 48hrs/ discharge was 3.83 (1.93 to 7.63,  $P = 0.0001$ ). The sensitivity and specificity of

different cut-offs of LATCH scores at birth and 48hrs/ discharge in Oxytocin group shown in Table 7. Highest sensitivity (100%) and specificity (65.62%) was noted for a latch score  $\geq 7$  at birth in Oxytocin group. The RR of a LATCH score of 7 or more at birth was 2.9 (1.8 to 4.7,  $P = <0.0001$ ). Highest sensitivity (100%) and specificity (84%) was noted for a latch score  $\geq 8$  at 48hrs/ discharge in Oxytocin group. The RR of a LATCH score of 8 or more at 48hrs/ discharge was 6.25 (2.54 to 15.34,  $P = 0.0001$ ). Correlation between LATCH scores and BSES-SF at 48 hrs/ discharge (Figure 2) and 6 weeks (Figure 3) showed a strong positive correlation which means high LATCH scores go with high BSES-SF scale in NVD group ( $r = 0.776$  and  $0.772$ ,  $P = <0.00001$  and  $<0.00001$ , Table 8). Correlation between LATCH scores and BSES-SF at

48 hrs/discharge (Figure 4) and 6 weeks (Figure 5) showed a strong positive correlation in Oxytocin group ( $r = 0.7669$  and  $0.7663$ ,  $P = <0.00001$  and  $<0.00001$ , Table 9).

## Discussion

In our study, we found that LATCH and BSES-SF scores were significantly lower in the Oxytocin group as compared to NVD group. We did not find any difference in the overall exclusive breast feeding rates at 6 weeks in both the groups. There are no latest studies on the impact of Oxytocin on breast feeding and LATCH scores. Jordan et al [16] analyzed the Cardiff Birth Cohort to compare breastfeeding rates at 48 hours after birth in women given oxytocin infusion with those who had received no oxytocin. The authors did not find a significant effect of oxytocin given for induction or augmentation on breastfeeding at 48 hours. In a study by Guerra et al [2] authors found there was delayed initiation of breast feeding in the oxytocin group. Dewey et al [17] and Matias et al [18] found augmentation with oxytocin was associated with delayed onset of lactogenesis but not associated with suboptimal infant breastfeeding behavior on day 0, 3, or 7.

In our study, we found that mother infant dyads with good LATCH score at birth in both the groups were exclusively breast feeding at 6 weeks compared to those who had moderate or poor scores. In a study by Tornese et al [19], authors found that good LATCH scores at birth were associated with exclusive breast feeding at discharge. In a study by Riordan et al [5] authors found that mothers breast feeding at 6 weeks had significantly higher LATCH scores and LATCH scores positively correlated with duration of breast feeding.

We tried to find out the optimum cut-off of LATCH score at birth and 48hrs/discharge in both the groups separately that can predict exclusive breastfeeding at 6 weeks postpartum. Kumar et al [20] also derived the cut-off for LATCH score at different time periods that can predict exclusive breastfeeding at 6 weeks. But in this study the role of oxytocin was not studied. To date we don't have any study that tried to derive different LATCH cut-offs for NVD and Oxytocin groups. We found that women with a LATCH score of 8 or more at birth were 2.54 times more likely to be breastfeeding at 6 weeks postpartum in the NVD group compared to women with lower scores. Women with LATCH score of 9 or more at 48hrs were 3.83 times more likely to be exclusively breastfeeding at 6 weeks in NVD group. Women with a LATCH

score of 7 or more at birth were 2.9 times more likely to be breastfeeding at 6 weeks postpartum in the Oxytocin group compared to women with lower scores and similarly women with a LATCH score of 8 or more at 48hrs were 6.25 times more likely to be exclusively breastfeeding at 6 weeks. We derived a lower cut-off in Oxytocin group at birth and 48hrs which signifies that women receiving intrapartum Oxytocin need assistance at lower LATCH thresholds in order to sustain breastfeeding at 6 weeks postpartum. In Kumar et al [20] study, the sensitivity of a maximum LATCH score during the 0 to 8 hour period of 6 or more was 92.8%, with a specificity of 30.2%. The RR for the score of 6 or more at the 0 to 8 hr time period was 2.3 (1.2-4.5),  $P = .001$ . At 48 to 72 hrs the sensitivity was 80% and specificity was 39.3% for LATCH score  $\geq 8$ . For 48 to 72 hours, the sample size ( $N = 23$ ) was low because of early hospital discharge ( $< 48$  hours). Therefore, the power to detect differences even if they truly exist is considerably lower than it is for the earlier time periods.

In our study, we found that there was positive linear correlations between LATCH scores and BSES-SF i.e, higher LATCH scores were associated with higher BSES-SF efficacy score. In a study by Gercek et al [21], authors found a weak positive correlation between LATCH score and BSES-SF. In a study by Rosa et al [22], they did not find any statistically significant difference in the duration of breast feeding in mothers with medium and high efficacy BSES-SF.

We did not study the impact of intrapartum Oxytocin administration on various components of LATCH score. We did not study the duration of breastfeeding with respect to breastfeeding self efficacy. We acknowledge these factors as our limitations.

## Conclusion

Use of Oxytocin during labor is associated with poor LATCH scores. Good LATCH score at birth is associated with exclusive breast feeding at 6 weeks post partum. LATCH tool assessed in the first days of life can predict exclusive breastfeeding at 6 weeks postpartum. There is a positive linear correlation between LATCH score and BSES-SF.

## Recommendations

Mothers who receive Oxytocin during labor should be identified as at risk for breast feeding problems and extra support should be provided for successful establishment of breastfeeding. LATCH score and

BSES-SF can be used as assessment tools at delivery in hospitals to assist in identifying and targeting mothers at risk of early weaning in order to improve the breast feeding duration as well as confidence in the mothers.

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