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RESEARCH ARTICLE

COMPARISON OF PLANNED CAESAREAN SECTIONS PERFORMED AFTER THE LABOR BEGINS WITH THOSE BEFORE THE LABOR BEGINS IN TERMS OF POSTPARTUM BREASTFEEDING AND MATERNAL ATTACHMENT LEVELS

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ABSTRACT

Purpose: This study was conducted to compare the postpartum breastfeeding and maternal attachment levels of women who underwent planned caesarean deliveries in which labor had begun and in which it had not.

Methods: This comparative-descriptive study was carried in postpartum services of a public hospital and a university hospital in a provincial center in eastern Turkey between March and August of 2017. This study included 180 women who underwent planned caesarean sections after labor began and 180 women who underwent planned caesarean sections before labor began. A personal information form, the LATCH Breastfeeding Assessment Tool, and the Maternal Attachment Scale (MAS) were used to collect the study data. For the statistical evaluation, the percentage distributions, arithmetic means, standard deviations, chi-squared test, independent samples t test, and Pearson correlation analysis results were used.

Results: In the puerperant who had undergone planned caesarean sections after labor began, the MAS total score mean was 97.08±7.54 and the LATCH score mean was 9.34±1.13. These means were 72.97±10.20 and 6.96±1.12, respectively, in the puerperant who had undergone planned caesarean sections before labor began ($p<0.001$). Additionally, in the puerperant who underwent planned caesarean sections after labor began, it was determined that the rates of breastfeeding and breast milk only feeding were significantly higher, while the jaundice development rate was significantly lower during the first half hour after birth ($p<0.05$).

Conclusion: The postpartum breastfeeding and maternal attachment levels were significantly higher in those women who underwent planned caesarean sections after labor began.

Keywords: After Labor Begins, Before Labor Begins, Maternal Attachment, Planned Caesarean, Postpartum Breastfeeding

INTRODUCTION

Recent developments in anesthesia and surgical techniques have made the caesarean section one of the most reliable surgical interventions. However, a caesarean section is only accepted as an important surgical procedure, saving the life of the mother and the baby, if it is done for the right reasons and at the right time. When the literature is examined, there are two types of caesarean section patterns, planned caesareans that are elective or performed due to any indications and emergency caesarean sections. An emergency caesarean section is a caesarean delivery that is performed unplanned, when a vaginal birth cannot be safely completed. A planned caesarean section is defined as a caesarean delivery performed without waiting for labor to begin (1, 2).

Today, an increasing number of planned caesarean sections are now being performed for elective reasons, maternal and infantile indications, and as repeated caesarean sections (1). The main difference for the infant is whether or not the caesarean section is performed before the beginning of labor. Until recently, innumerable negative stress deprivation effects have been ignored in babies born via planned caesarean sections before the beginning of labor (1, 3, 4). The literature emphasizes the need to consider the effects of the fetal stress hormones, such as endorphins, noradrenaline, adiponectin, melatonin, and oxytocin, secreted during labor (3, 5, 6).

Oxytocin is the most well-known hormone involved in labor. It has been reported that oxytocin is released during pregnancy, with its level gradually increasing by the beginning of labor (6, 7). At the same time, oxytocin is the “love” hormone, which is found everywhere love exists. For example, the oxytocin level is increased by sexual activity, breastfeeding, labor, and seeing someone who is loved very much (1, 8, 9). Oxytocin is effective during the last step of childbirth, during placental birth, and it is secreted in the mother’s milk during breastfeeding. Additionally, it has been suggested that oxytocin increases a mother’s affection and interest in her baby, and that it is very important for displaying maternal behaviors (10-12). In this regard, oxytocin is an effective factor involved in breastfeeding and maternal attachment. Moreover, the fact that planned caesarean sections delay the beginning of natural oxytocin release increases the importance of this research topic (7, 13).

In recent years, researchers have debated about whether women who undergo planned caesarean deliveries without labor pain are able to secrete oxytocin as effectively as women who give birth under normal physiological conditions. A study conducted in Sweden noted that oxytocin should be secreted with frequent contractions in order to be effective, and the researchers emphasized the need to choose the form of delivery based on this condition (1). It was also reported that as much labor as possible should pass before performing the caesarean section. In the literature, it has been emphasized that the best alternative to a vaginal delivery for midwives in cases in which the delivery progression is intervened is a “caesarean section in action,” which should be decided on before an emergency caesarean section becomes necessary (4). Based on this point of view, one wonders how the onset of labor will have an effect on the breastfeeding and maternal attachment levels after a planned caesarean section. Therefore, this study was conducted to compare the postpartum breastfeeding and maternal attachment levels in planned caesarean deliveries in which labor began before the caesarean section with those in which active labor had not begun.

METHODS

This comparative-descriptive study was carried out at the childbirth and postpartum services of a public hospital and a university hospital in a provincial center in eastern Turkey between March and August of 2017. Between January 2016 and December 2016, the number of women who had a cesarean delivery at a university hospital was 918 and the number of women who had a cesarean delivery at the public hospital was 2547.The research population was composed of women who underwent planned caesarean deliveries in the institutions mentioned. Based on the results of a power analysis, the sample size was determined to be 346 puerperant, with a 0.05 error level, 95% confidence interval, and 80% ability to represent the population. The women who underwent caesarean sections in the related hospitals and met the criteria for participating in this research were selected using a non-random sampling method until the specified number of women was reached. This study included 180 women who underwent planned caesarean sections after labor began and 180 women who underwent planned

caesarean sections before labor began.

The study included women who could communicate verbally, whose pregnancy was planned, that pregnancy did not occur with assisted reproductive techniques, who were within the first 48 hours after delivery, who had a cesarean section at term (36 weeks and above), and who did not develop any complications related to the postpartum period in the mother and newborn.

Data Collection Tools

The data were obtained using a personal information form, the LATCH (latching, audible swallowing, nipple type, comfort, and help needed) Breastfeeding Assessment Tool, and the Maternal Attachment Scale (MAS).

Personal Information Form

The personal information form used in this study was created by the researcher to determine the sociodemographic characteristics (age, educational status, employment status, place of residence, family structure, income status, spouse's age, spouse's educational status, and spouse's employment status) and certain fertility characteristics of the puerperant who underwent caesarean sections (delivery week, number of pregnancies, caesarean section experience, caesarean section indications, time range of delivery, and the baby's gender) (4, 7, 13).

LATCH Breastfeeding Assessment Tool

The LATCH is one of the measurement tools used to evaluate breastfeeding, and it was used to objectively observe the breastfeeding status of the nursing mothers included in this study. The LATCH was created in 1986 as a scoring method analogous to the Apgar score. The LATCH helps a healthcare professional assess breastfeeding both quickly and easily. Moreover, this measurement tool was developed to objectively evaluate breastfeeding, identify breastfeeding problems, establish a common language among healthcare professionals, make training plans, and evaluate the breastfeeding success in general (14, 15). The LATCH Breastfeeding Assessment tool, which consists of five evaluation criteria, was developed by Jensen, Wallace, and Kelsay in 1994 based on the Apgar scoring system, and it was adapted to Turkish by Yenal ve Okumuş in 2003 (Cronbach's α=0.95) (14, 16). In this study, the LATCH Cronbach's α was 0.84. When using the LATCH, 0, 1, and 2 points are given for each criterion, and the breastfeeding is evaluated by summing up the points. As the total score increases, the breastfeeding success also increases (14-16).

Maternal Attachment Scale (MAS)

The MAS was developed by Müller in 1994 in order to determine the love and attachment of the mother toward her baby, and it is a 4-point Likert-type measure of 26 items. The highest score that can be achieved is 104, and the lowest score is 26. A high score indicates that the maternal attachment is also high (17). The Turkish adaptation, validity, and reliability study of the MAS was conducted by Kavlak and Şirin, and its Cronbach's α value for the internal consistency and reliability was 0.77 for mothers with 1-month-old infants (18). In this study, the Cronbach's α value of the MAS was 0.98.

Data Collection

The research data were obtained by the researcher at the aforementioned clinics between March and August of 2017. During the first 48 hours after delivery in the hospital clinic, a face-to-face interview was conducted to collect the participant's personal identification form data and observe her breastfeeding method for the LATCH. At the end of the first postpartum month, a telephone interview was conducted to collect the MAS data and to ask whether jaundice developed in the newborn.

Data analysis

The data coding and evaluation were carried out using IBM SPSS Statistics for Windows (version 22.0; IBM Corp., Armonk, NY, USA). The statistical methods that were used to evaluate the study data included the percent distributions, arithmetic means, standard deviations, chi-square tests, independent samples t tests, and Pearson's correlation analyses. The statistical significance was accepted as a p value of < 0.05.

Ethics Consideration

Prior to the study, written permission was obtained from the institutions in which the study was conducted, and ethical approval was obtained from the Scientific Research and Publication Ethics Committee of the Inonu University of Health Sciences in Turkey on 04/04/2017 (No. 2017/8-1). Permissions were obtained from the authors who validated the scales that were used. In addition, before the

Table 1. Comparison of The Descriptive Characteristics of The Women Who Underwent Planned Caesarean Sections Before Labor Began and After Labor Began.

	The Labor Began (n=180)		The Labor Did Not Began (n=180)		
Descriptive Characteristics	**n**	**%**	**N**	**%**	**Test and p value**
Age (years)					
17-25	59	32.8	43	23.9	X^2=4.130
26-34	91	50.6	97	53.9	p=0.127
35 ↑	30	16.6	40	22.2	
Spouse Age (years)					
17-25	20	11.1	27	15.0	X^2=1.844
26-34	94	52.2	83	46.1	p=0.398
35 ↑	66	36.7	70	38.9	
Educational Status					
Primary school	55	30.6	66	36.7	X^2=3.205
Secondary School	36	20.0	41	22.8	p=0.361
High school	55	30.6	42	23.3	
Universty	34	18.8	31	17.2	
Employment Status					
Employed	21	11.7	12	6.7	X^2=2.702
Unemployed	159	88.3	168	93.3	p=0.100
Spouse Educational Status					
Primary school	38	21.1	56	31.1	X^2=5.613
Secondary School	44	24.4	45	25.0	p=0.132
High school	62	34.4	48	26.7	
Universty	36	20.1	31	17.2	
Spouse Employment Status					
Employed	165	91.7	169	93.9	X^2=0.663
Unemployed	15	8.3	11	6.1	p=0.415
Place of Residence					
Province	124	68.9	125	69.4	X^2=0.123
Town	36	20.0	37	20.6	p=0.940
Village	20	11.1	18	10.0	
Family Structure					
Nuclear family	122	67.8	129	71.7	X^2=0.645
Extended family	58	32.2	51	28.3	p=0.422
Income Status					
Less than my revenues	26	14.4	30	15.6	X^2=4.174
The revenue is equal to the expense	135	75.0	119	66.1	p=0.124
More than my revenue	19	10.6	31	17.3	

questionnaires were filled out, written and verbal approvals were obtained from the study participants with the aim of protecting their rights in line with the principles of "Autonomy" using the "Informed Consent Form of Volunteers."

RESULTS

Table 1 compares the descriptive characteristics of the two study groups. There were no statistically significant differences between the puerperant who underwent planned caesarean sections before labor began and after labor began with regard to the age, spouse's age, educational status, spouse's educational status, employment status, spouse's employment status, place of residence, family structure, and income status (p>0.05, Table 1). It was determined that the two groups had similar descriptive characteristics.

Table 2 compares the fertility characteristics of the two study groups. There were no statistically significant differences between the puerperant who underwent planned caesarean sections before labor began and after labor began in terms of their fertility characteristics, including the delivery week, number of pregnancies, caesarean section experience, caesarean section indications, anesthesia method,

Table 2. Comparison of The Fertility Characteristics of The Puerperant Who Underwent Planned Caesarean Sections Before Labor Began and After Labor Began.

The Fertility Characteristics	The Labor Began (n=180)		The Labor Did Not Began (n=180)		Test and p value
	$\bar{X}$ ±SD		$\bar{X}$ ±SD		
Delivery Week	38.55±1.18		38.51±0.86		t=0.305 p=0.761
	n	**%**	**N**	**%**	
Number of Pregnancies					
Primigravida	60	33.3	56	31.1	X^2=0.204
Multigravida	120	66.7	124	68.9	p=0.652
Caesarean Section Experience					
Primary	131	72.8	126	70.0	X^2=0.304
Repeated	49	27.2	54	30.0	p=0.560
Caesarean Section Indications					
Elective	26	14.4	21	11.7	X^2=0.612
Medical indication	154	85.6	159	88.3	p=0.434
Anesthesia Method					
General	30	16.7	26	14.4	X^2=0.338
Spinal	150	83.3	154	85.6	p=0.561
The Time Range Between Which The Deliveries Happened					
08:00-17:59	81	45.0	171	95.0	X^2=10.820
18:00-23:59	45	25.0	7	3.9	**p=0.000****
00:00-07:59	54	30.0	2	1.1	
Baby's Gender					
Female	84	46.7	91	50.6	X^2=0.545
Male	96	53.3	89	49.4	p=0.460

* $\bar{X}$:Mean, **SD:** Standard Deviation

**p<0.001

and baby's gender (p>0.05, Table 2). Therefore, it was determined that the two groups exhibited similar fertility characteristics. Moreover, only the time range between which the deliveries occurred was statistically different between the groups. The proportions of the births that occurred between 08:00 and 17:59 were 45% in the group of women in which labor began and 95% in the group in which labor did not begin (Table 2, p<0.001).

Table 3 shows the comparison of the MAS and LATCH mean scores between the women who underwent planned caesarean sections before labor began and after labor began. In the group in which the caesarean sections were performed after labor began, the MAS total score mean was 97.08±7.54 and the LATCH total score mean was 9.34±1.13. The mean scores were 72.97±10.20 and 6.96±1.12, respectively, for the women who underwent caesarean sections before labor began. Based on the statistical evaluation, the MAS and LATCH total score means for the women who underwent planned caesarean sections after labor began were statistically significantly higher (p<0.001) than the

Table 3. Comparison of the MAS and LATCH mean scores of the women who underwent planned caesarean sections in which labor began and in which it had not begun.

Scales	The Labor Began (n=180)	The Labor Did Not Began (n=180)	Test and p value	
	X±SD	X±SD	t	p
MAS	97.08±7.54	72.97±10.20	25.485	**0.000****
LATCH	9.34±1.13	6.96±1.12	20.092	**0.000****

* $\bar{X}$:Mean**, SD:** Standard Deviation

**p<0.001

Table 4. Postpartum breastfeeding assessment comparison of the women who underwent planned caesarean sections in which labor began and in which it had not begun.

	The Labor Began (n=180)		The Labor Did Not Began (n=180)		
Postpartum Breastfeeding Story	**n**	**%**	**n**	**%**	**Test and p value**
First Breastfeeding Time					
Within the first half hour	149	82.8	8	4.4	X^2=22.890
Between Half Hour and One Hour	14	7.8	36	20.0	**p=0.000***
An hour later	17	9.4	136	75.6	
Newborn Nutrition Shape Within the First 24 Hours					
Only Breastfeeding	30	16.7	4	2.2	X^2=36.192
Formula Only Mama	1	0.5	19	10.6	**p=0.000***
Both Breast Milk and Formula Mama	149	82.8	157	87.2	
Newborn Jaundice Development Status					
Yes	24	13.3	152	84.4	X^2= 18.210
No	156	86.7	28	15.6	**p= 0.000***

*p<0.001

scores of the women who underwent planned caesarean sections after labor began.

Table 4 shows the postpartum breastfeeding assessments of the two study groups. In the group of women who underwent planned caesarean sections after labor began, the breastfeeding and feeding only breast milk rates were significantly higher and the jaundice development rate was significantly lower during the first half hour, when compared to those women who underwent planned caesarean sections before labor began.

Table 5 reveals the relationships between the MAS and LATCH mean scores of the two study groups. Based on the correlation analysis results, there was a significant correlation, at a weak level, between the MAS and LATCH mean scores of the women who underwent planned caesarean sections performed before and after the beginning of labor. Overall, the level of attachment increased as the breastfeeding success increased.

DISCUSSION

This study was conducted to compare the postpartum breastfeeding and maternal attachment levels of women who underwent planned caesarean deliveries before and after labor started. When the two groups of puerperant who underwent planned caesarean sections were compared in terms of their descriptive characteristics, there were no statistically significant differences between the groups with regard to the age, spouse's age, educational status, spouse's educational status, employment status, spouse's employment status, income status, place of residence, and family structure. The similarity evaluation between the two study groups in terms of the aforementioned descriptive characteristics showed that the groups exhibited homogeneous distributions.

When the study groups were compared in terms of their fertility characteristics, there were no statistically significant differences between the puerperant who underwent planned caesarean sections after labor began and those who underwent them before labor began with regard to the delivery week, number of pregnancies, caesarean section experience, caesarean section indications, anesthesia method, and baby's gender. However, the time range in which the deliveries occurred was statistically significantly different between the groups. The proportions of births that occurred between 08:00 and 17:59 were 45% in the group whose labor had begun and 95% in the group whose labor had not begun. In terms of the aforementioned fertility characteristics, with the exception of the delivery time range, the two study groups exhibited similar characteristics. One possible reason why the time range during which more deliveries occurred was between 08:00 and 17:59 in the group in which labor had not begun was because the planned caesarean sections were usually performed during normal working hours. For example, in one Turkey study, 52.9% of the caesarean births occurred between 08:00 and 17:00, with only 6.4% of the caesarean deliveries occurring between 00:00 and 07:59. It is stated that this difference is due to the fact that the elective and recurrent cases are performed during working hours (7). Based on an examination of the literature, the postpartum breastfeeding success levels have generally been examined in three groups, vaginal deliveries, planned caesarean sections, and

Table 5. The relationship between the MAS and LATCH mean scores of the puerperant who underwent planned caesarean sections performed before and after the beginning of labor.

The Labor Began	X±SD	Test and p value	
MAS	97.08±7.54		
LATCH	9.34±1.13	r=0.262	**0.016****
The Labor Did Not Began			
MAS	72.97±10.20	r=0.167	**0.025****
LATCH	6.96±1.12		

*r: Pearson Correlation

**p<0.05

emergency caesarean sections, and the breastfeeding success rate of the puerperant who underwent planned caesarean sections was lower (19, 20). In a study performed by Zanardo et al. in 2012, the lactation performance was compared among three groups, vaginal deliveries, planned caesarean sections, and emergency caesarean sections, and the lowest lactation performance was found in the planned caesarean group (19). Similarly, Heasman et al. compared the postpartum plasma prolactin concentrations among three groups, vaginal deliveries, planned caesarean sections, and emergency caesarean sections, and they determined that the mean prolactin concentration was significantly lower in the planned caesarean section group than in the other groups (20).

The available research about planned caesarean section cases before and after the beginning of labor was limited in terms of breastfeeding. In 2002, Doğanay and Avşar conducted a study that examined the secretion time and breast milk amount among three groups, emergency caesarean sections, caesarean sections that presented after labor began, and planned caesarean sections. The researchers determined that the lactation time began earlier and the milk amount was higher in the caesarean group in which the labor had already begun, when compared to the other groups. Moreover, the group in which the lactation began latest was the group of women who underwent planned caesarean sections in which labor had not begun (21). Similar results were obtained in this study, in which the LATCH total score mean was significantly lower in the puerperant who underwent planned caesarean sections in which labor had not begun, when compared to those in which labor had begun. The decline in the planned caesarean group in which labor did not begin may be related to the absence of spontaneous uterine contractions, and thus, a delay in the release of natural oxytocin and prolactin. Similarly, in a Swedish study, it was emphasized that oxytocin should be secreted along with frequent contractions in order to be effective. In a study conducted by Nissen et al., it was reported that the milk transfer from the mother to the infant is directly related to the release of oxytocin (13). When evaluated in this respect, it can be seen that the beginning of spontaneous labor is an important factor for successful breastfeeding after a planned caesarean delivery, and that the results obtained were consistent with the literature. Moreover, in this study, this view is supported by the fact that the rates of feeding only breast milk and breastfeeding within the first half hour were significantly higher, while the jaundice development rate was lower in the group who underwent planned caesarean sections after the beginning of labor than in those who underwent them before the beginning of labor.

It has been reported in the literature that a caesarean delivery may prevent the mother from forming an attachment to her baby, prevent her from having a positive relationship with her baby, and make it difficult for the mother to accept the baby during the postpartum period. For this reason, the early initiation and support of the mother-infant relationship during a caesarean delivery are emphasized (22, 23). In this study, the MAS total score mean was 97.08±7.54 for the group who underwent planned caesarean sections after labor started, but it was 72.97±10.20 for the group who underwent them before labor started. The difference between these mean scores was statistically significant. It has been emphasized in the literature that the delayed release of natural oxytocin and prolactin during a planned caesarean delivery may also cause delayed maternal behavior, which may negatively affect maternal attachment (24, 25). However, there have been no studies about the maternal attachment levels in terms of women undergoing planned caesarean sections, exclusively,

before and after the beginning of labor. In principle, the gynecologist, delivery day and hour, hospital, and hospital room of the woman who will undergo the caesarean section are determined in advance, and these plans ensure that the woman is psychologically prepared for the delivery (26). In this study, it is a noteworthy finding that the MAS total score mean was significantly lower in the group who underwent planned caesarean sections before the beginning of labor, even though they were prepared for the delivery. This decline may be related to the release of natural oxytocin and prolactin, and consequently, to the late onset of lactation. It has been suggested that oxytocin, the "love" hormone, is an important variable for increasing a mother's interest in and affection toward her baby, as well as exhibiting maternal behaviors (7, 10, 11). In this regard, it can be seen that oxytocin is an effective factor for breastfeeding and maternal attachment. This opinion was supported by the results showing that as the breastfeeding success increased in the groups who underwent planned caesarean sections before and after the beginning of labor, the level of maternal attachment increased significantly. It has also been reported that, in the same manner, the level of attachment is higher in puerperant with high breastfeeding success levels (27). Accordingly, it can be concluded that any problem encountered during breastfeeding can also negatively affect maternal attachment.

CONCLUSIONS

The puerperant in the two study groups were similar in terms of their descriptive and fertility characteristics. The postpartum breastfeeding and maternal attachment levels were significantly higher in the group of women who underwent planned caesarean sections after labor began than in those who underwent them before labor began. Moreover, in the group who underwent planned caesarean sections after labor began, the rates of breastfeeding and feeding only breast milk were significantly higher, while the jaundice development rate was significantly lower during the first half hour. The results also showed that as the breastfeeding success level increased in both groups, the maternal attachment level also increased at a significant level.

Based on the results of this study, it may be advisable to wait as long as possible for the beginning of labor in planned caesarean section pregnancies. Additionally, more extensive studies should be conducted comparing "caesarean sections in action" in which labor has begun to other forms and durations of delivery.

Limitations

One limitation of this study was the fact that a non-random sampling method was used. In addition, it was not possible to reach the puerperant who underwent planned caesarean sections due to the researcher's absence from the clinic based on working conditions.

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