Factors Affecting Post-Cesarean Pain Intensity in Patients at Taleghani Hospital in 2021

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ABSTRACT

Background & Objective: In all surgical interventions including cesarean section, pain is a challenging issue. The aim of this study was to identify the underlying causes that affect post-cesarean pain intensity.

Materials & Methods: A total of 128 consecutive patients who underwent cesarean section at Taleghani hospital were included in the study. A questionnaire was used to gather the patients' demographic and clinical data. The length of the incision was measured with a ruler on the first day following the cesarean section. In addition, the pain intensity was assessed using a Likert scale at scales: 1, 2, 4, 8, 12, and 24, on the day after surgery and 48 hours and one week later. Descriptive statistics were calculated for all variables. Analyses were conducted using SPSS version 22 and a p-value < 0.05 was considered statistically significant.

Results: The study showed that overall, patient age, BMI, level of education, type of surgical incision, duration of surgery, type of cesarean section, type of anesthesia, and breastfeeding were not predictors of postoperative pain intensity. However, the study found that "indication of the cesarean section" and the "stage of labor" in which the cesarean was performed are correlated with postoperative pain intensity. (P-value<0.05)

Conclusion: In this study, we were able to identify 2 parameters that were independently associated to postoperative pain scores: "underlying indication of cesarean section" and the "stage of labor" in which cesarean section is performed. This information helps clinicians to identify high-risk patients in terms of postoperative pain and take early action.

Keywords: Cesarean Section, Postoperative Pain Assessment, Visual Analogue Scale

Introduction

Pain is one of the most prevalent postoperative issues that threatens the patients' capacity and, more than any other issue, makes them fearful and anxious and compels them to seek assistance (1, 2). Poor postoperative pain control can dramatically contribute to postoperative complications and delay the recovery of patients and their ability to return to daily activities (3) Early recovery for the patient who cares for the newborn right away after surgery is crucial. (4, 5). Fear of the unknown aggravates pain, and patients who are less afraid, have more faith in their caregivers (6) Fear, anxiety, and pain are three factors that play an important role in the process of labor and delivery, and

reducing fear and anxiety will result in mental and physical peace. The intensity of pain during childbirth is heavily influenced by the mother's mental stress, so identifying and dealing with high-risk cases is one of the most effective non-pharmacological methods to reduce pain and deal with stress before and after childbirth (7, 8). For many women, the pain of childbirth remains the most painful experience in their entire life. Childbirth pain, unlike other types of pain, is perceived exclusively by the individual and is a completely personal experience (9, 10). Despite the global approach to physiological childbirth, today cesarean section is one of the most common obstetric

surgeries and one of the most common female surgeries **(11, 12)**. Over the past few decades, the number of women who give birth by cesarean section is increasing both in developed countries and in developing countries **(13, 14)**. In 2010, the World Health Organization reported the cesarean rate in Iran to be 41.9% **(15, 16)**. Cesarean delivery is associated with complications such as subsequent ectopic pregnancy, postpartum bleeding and hysterectomy, latex allergy, parietal endometriosis, gall bladder diseases, appendicitis, and increased length of hospital stay and other complications **(17)**. Pain from tissue damage, visceral expansion, and uterine contractions are among the challenges that cesarean section patient's face **(18, 19)**. The first 48 hours after a caesarean section are typically marked by moderate to severe pain. Despite progress in understanding the pathophysiology of postoperative pain and the development of painkillers, many patients still suffer from moderate to severe pain. According to the World Health Organization, pain was the leading cause of death and disease burden in the world in 2003, and it is still the leading factor today which has an impact on both patients and hospital staff. Having a child is a happy moment, but if there is pain during childbirth, it can be destructive. Considering the unwanted effects of pain on physical and mental health and the healing process of patients and imposing an additional cost and considering that few studies have been done in this field, we decided to investigate the severity of postoperative pain and the factors that may predict the amount of pain after cesarean section in this study.

Methods

We included patients scheduled for cesarean delivery in Shahid Beheshti University of Medical Sciences, Taleghani hospital in this cross-sectional study. According to the results of previous studies, the sample size was estimated to be 128 people. Following approval by the medical ethics committee, all participants were asked to sign a written consent. Patients who did not speak Persian and were unable to communicate verbally, as well as those who experienced complications during the surgery, such as postpartum bleeding, were excluded from the study. The clinical and demographic data of the patients were collected through a questionnaire. . The length of the incision was measured with a ruler on the first day following the cesarean section. In addition, the pain intensity was assessed using a Likert scale at scales: 1, 2, 4, 8, 12, and 24, on the day after surgery and 48 hours

and one week later. All participants were asked to rate their level of pain on an 11-point scale: The pain scale ranged from 0 to 10, with 10 representing the most severe pain. The numerical rating scale (NRS) has been shown to have a high correlation with other pain assessment tools in several studies and its reliability has been proven. Since NRS administration could be done verbally, it was used in phone interviews for the follow-up assessments. Descriptive statistics were calculated for all variables. The Chi-square test, student's t-test, and Pearson correlation test were used for qualitative and quantitative variables accordingly. Analyses were conducted using SPSS version 22 and a p-value < 0.05 was considered statistically significant.

Results

The age in the whole study population ranged between 14 and 41 years old and most of the patients were 25-30 years old, (38 patients, 29.7%). The most common range of BMI was 25-30 (60 patients, 46.9%) and the least prevalent range of BMI was less than 18.5 (2 patients, 1.6%). Most of the patients had an education level below diploma, (51 patients, 39.8%) and 50 patients (39.1%) had a diploma, and the number of illiterate patients was 12 (9.4%). A total of 67 patients (52.3%) had underlying diseases and 61 patients (47.7%) did not have underlying diseases. In 2 patients (1.6%) the surgical incision was Midline and in 126 cases (98.4%) the surgical incision was Pfannenstiel. The least common indication for cesarean was failure to progress of labor (4 cases, 3.1%) and the most common indication was previous cesarean delivery (63 cases, 49.2%). The duration of 69 surgeries (53.9%) was more than one hour, while the duration of only 4 surgeries (3.1%) was less than half an hour. A total of 73 cesarean sections (57%) were performed in emergency setting and 55 cesarean sections (43%) were scheduled electively. In 90 cases (70.3%), the cesarean section was performed before the onset of labor, while 32 cases (25%) were performed during the latent phase of labor and 6 cases (4.7%) were performed during the active phase of labor. A total of 111 cases (86.7%) underwent spinal anesthesia and 17 cases (13.3%) underwent general anesthesia. In 113 cases (88.3%) no intraoperative adhesions were observed, while in 15 cases (11.7%) noticeable intraoperative adhesions were reported. The mean incision length in the study population was 15.41 ± 2.23. The average birth weight of newborns in this study was 2988.25 ± 667.63 grams (Table 1).

Table 1. Demographic information of cesarean section patients in Taleghani Hospital

Demographic characteristics		Frequency	Percent
Age	14-19	4	3.1
	20-25	29	22.7
	25-30	38	29.7

Demographic characteristics		Frequency	Percent
	30-35	25	19.5
	35-40	25	19.5
	<40	7	5.5
	<18.5	2	1.6
	18.5-25	25	19.5
BMI	25-30	60	46.9
	30-35	31	24.2
	35-40	5	3.9
	>40	5	3.9
	Illiterate	12	9.4
Education	High school	51	39.8
	Diploma	50	39.1
	University	15	11.7
underlying disease	Have	67	52.3
	No have	61	47.7
addiction	Have	3	2.3
	No have	125	97.7
Surgical incision	midline	2	1.6
	Pfannenstiel	126	98.4
	fetal distress	13	10.2
	failure to progress	4	3.1
Reason for caesarean section	Repeat cesarean	63	49.2
	malpresentation	12	9.4
	Multiple gestation	5	3.9
	Meconium passage	31	24.2
	0-30 min	4	3.1
Operation time	30-60 min	55	43.0
	> 60 min	69	53.9
Type of surgery	Emergency	73	57.0
	Elective	55	43.0
	No labor pain	90	70.3
Timing of caesarian	latent phase	32	25.0
	Active phase	6	4.7
Type of anesthesia	spinal	111	86.7
	general	17	13.3

According to patient reports, the mean pain score within the first hour after surgery was 6.72 ± 2.9, after two hours post-operation was 6.79 ± 1.87, after four hours it was 5.96 ± 1.99, after eight hours it was 5.06 ± 2.08, after twelve hours it was 3.61 ± 1.99, after twenty-four hours it was 2.45 ± 1.74, 48 hours later, it was 1.37 ± 1.35 and when the stitches were removed, the pain score decreased to less than 1 (Table 2).

Table 2. Descriptive examination of average pain intensity at different hours after surgery in patients

	Minimum	Maximum	Mean	Std. Deviation
Pain in the first hour	.00	10.00	6.72	2.9
Pain score after two hours	.00	10.00	6.79	1.87
Pain score after four hours	1.00	10.00	5.96	1.99
Pain score after eight hours	.00	9.00	5.06	2.08
Pain score after twelve hours	.00	9.00	3.61	1.99
Pain score after twenty-four hours	.00	8.00	2.45	1.74
Pain score after forty-eight hours	.00	7.00	1.37	1.35
Pain when removing the stitches	.00	4.00	.65	.89

Factors affecting the pain score

Among the variables studied, no significant difference was observed in the pain score based on patient age, BMI, education, type of surgical incision, duration of operation, type of cesarean section, type of anesthesia, attachment, and breastfeeding of the baby. (P>0.05). However, "reason for cesarean section" and "stage of labor" were found to be correlated with the pain score of the patients. (P=0.02 and P=0.00 respectively) (Table 3)

Table 3. Investigation of factors affecting pain after cesarean section

Variables		N	Mean	Std. Deviation	P value
Age	14-19	4	2.75	.96	
	20-25	29	3.68	1.16	
	25-30	38	3.87	1.16	
	30-35	25	4.61	1.29	0.912
	35-40	25	4.34	1.37	
	<40	7	3.45	1.45	
	Total	128	4	1.29	
BMI	<18.5	2	3.37	.53	
	18.5-25	25	3.86	1.23	
	25-30	60	4	1.4	
	30-35	31	4.15	1.23	0.765
	35-40	5	3.58	.76	
	>40	5	4.56	1.37	
Education	Illiterate	12	3.58	.78	
	High school	51	3.8	1.23	
	Diploma	50	4.21	1.42	0.187
	University	15	4.35	1.27	
Incision type	midline	2	3.56	.79	0.625
	Pfannenstiel	126	4.01	1.30	
Reason incision	fetal distress	13	3.84	.81	
	failure to progress	4	3.78	.67	
	Repeat cesarean	63	3.9010	1.30	
	malpresentation	12	4.42	1.91	0.02

Variables		N	Mean	Std. Deviation	P value
	Multiple gestation	5	4.28	1.67	
	Meconium passage.	31	4.11	1.19	
	0-30 min	4	3.59	1.52	
	30-60 min	55	4.07	1.44	
Timing OR	> 60 min	69	3.98	1.16	0.272
Cesarean type	Emergency	73	4.00	1.30	0.971
	Elective	55	4.01	1.30	
	No pain	90	4.02	1.26	
	latent phase	32	3.6	1.03	
Cesarean	Active phase	6	5.84	1.60	0.00
Anesthesia type	spinal	111	4.05	1.35	0.271
	general	17	3.68	.77	
	yes	15	4.31	1.58	0.327
Adhesion	no	113	3.96	1.25	
Breastfeeding	No	28	3.85	1.59	
	Yes	45	4.08	1.18	0.491
Incision length		128	15.41	2.23	0.005

Discussion

Pain causes adverse psychological responses such as anxiety, sadness, aggression, insomnia, and etc. Furthermore, the pain experienced by patients following a cesarean section reduces the flow of breast milk and the mother's tolerance to breastfeeding the baby. In the study of sun et al., which was published in 2019 in the International Journal of Anesthesiology and Obstetrics, the incidence and pathophysiology, and risk factors affecting pain after cesarean section were discussed. Risk factors were divided into three categories:1: pre-operative risk factors including social and psychological factors such as anxiety, pre-operative depression, stress, low socio-economic status, deprivation, request for emergency cesarean section, low maternal weight, pre-operative pain, Use of narcotic drugs, and previous surgery.2: Risk factors during surgery including surgical technique, Pfannenstiel incision (number and length), duration of surgery, injury, and nerve entrapment, Anesthesia technique including general or spinal, regional anesthesia, spinal morphine, and dose of spinal drugs. 3: Post-operative factors including acute post-operative pain, and postpartum depression (20). Some variables were also found to have an effect on pain after cesarean section in our study. For example, reason for cesarean section, and cesarean section during the active phase of labor are all factors that had an effect on the intensity of pain after cesarean section, which is similar to the results of previous studies. In a study by Demelash and colleagues in 2019 in northwest Ethiopia, which was conducted with the goal of determining the prevalence

and factors associated with pain after cesarean section, a total of 290 patients were included in the study. A numerical rating scale was used to evaluate the pain. In this study, the incidence of moderate to severe pain in the first 24 hours after the surgery was 85.5%. In multivariable analysis, preoperative anxiety and history of previous cesarean section and Pfannenstiel incision and lack of regional anesthesia were significantly associated with moderate to severe pain after cesarean section (21). According to the results of this study, it can be pointed out that patients with higher levels of anxiety or with a history of previous cesarean delivery are more likely to experience severe pain in post- cesarean section period. In a study by Mekonnen et al., which was conducted in 2020 as a cross-sectional survey, a total of 153 pediatric participants aged 2 to 12 years were included in the study. The prevalence of moderate to severe pain after pediatric surgery was 40.5%. Preoperative anxiety, history of preoperative pain, brain and nerve surgery, incision size greater than 10 cm were significantly associated with postoperative pain (22). This study also considers the size of the surgical incision as one of the variables affecting the intensity of the pain experienced by patients. Tissue damage following surgical incision causes the release of pain mediators such as prostaglandins, histamine, serotonin, bradykinin, substance P, etc. In the study of chan, which was conducted in 2012 on 590 patients at the Singapore General Hospital a total of 65.4% of the patients had a delayed discharge, and 28.3% had uncontrolled pain. Factors associated with pain and

postoperative complications were younger age, admission on the same day, duration of surgery of more than 2 hours, abdominal, upper limb and spine surgeries, and general anesthesia. Higher BMI, abdominal, spine, and surface surgeries were all associated with discharge delays (23). In the cross-sectional study of Borges and colleagues in 2017, a total number of 1062 patients were interviewed before and after the cesarean. The amount of pain after the operation and its quality were evaluated by a numerical pain scale. Up to 92.7% of patients experienced pain after surgery. 91.6% of participants used the word "painful", 70% used "tenderness" and 56.1% used the word "throbbing" to describe the pain (24). Jasim et al. conducted a study on 400 patients in Malaysia in 2013 under the title of factors affecting pain after cesarean among Malaysian women. In the first 48 hours after the operation, the average pain during rest and movement was 0.4 and 0.8. The statistical analysis revealed that Higher BMI, increased length of operation, single women, blood type O, and general anesthesia were variables affecting pain after cesarean section (25).

Conclusion

The results of this study showed that the reason for cesarean section and the stage of cesarean section are important factors influencing the pain intensity of patients, and these factors aid in identifying patients who are at higher risk.

Acknowledgments

Conflict of Interest

The authors declared no conflict of interest.

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