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Research Article

Frequency of Pain Intensity and Factors Affecting it after Cesarean Section Using Spinal Anesthesia

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ABSTRACT

Background: Postoperative pain is an important public health issue that affects the sensory and emotional experiences of patients. This study aimed to understand the impact of pain management on patients.
Methods: The present study was a retrospective cross-sectional study conducted on women over 18 years of age who underwent cesarean section with spinal anesthesia in Shahid Beheshti Hospital of Isfahan.
Results: In this study, 250 women with a Mean age of 31.75 years and a Mean pain intensity of 8.15 participated. Postoperative pain was more common in people without underlying disease and obese people had more pain. Intravenous pain relievers such as pethidine and diclofenac suppositories temporarily reduced the pain intensity.
Conclusion: This study showed that the pain after cesarean section was significantly influenced by the length of the operation, the type of anesthesia, and painkillers, which require strategies to reduce the pain.

Introduction

Discomfort is the most common complaint after surgery. Physiological, sensory, emotional, cognitive, social, cultural, and behavioral factors all affect pain's sensory and emotional experience [1]. Although pain is a necessary part of the recovery process after surgery, it is often mismanaged, which can have adverse consequences [2]. Untreated postoperative pain can lead to clinical and psychological changes that increase morbidity and mortality and decrease quality of life. Resume their normal activities [3]. Over the past three to four decades, research has consistently shown that 20% to 80% of patients experience pain that is not properly addressed after surgery [4-5], and this pain is referred to as it is recognized as an important public health issue in both developed and developing countries [6].

Pain after cesarean section is one of the common causes of acute pain in obstetrics and gynecology, and despite improvements in postpartum pain management, pain relief, and patient satisfaction are still not acceptable in many cases [7]. According to a study conducted in 2020, the incidence of moderate to severe acute pain in 24 hours after cesarean section was 21% [8]. Postoperative pain is inadequately managed in more than 80% of patients in the United States, and poor control of acute postoperative pain is associated with increased complications, impaired function and quality of life, delayed recovery time, prolonged use of opioids, and higher health care costs are associated [9]. Also, this pain can damage the mother's ability to take care of the baby, the first interaction between mother and child, and effective breastfeeding [10]. Severe acute pain after surgery has been a clear predictor of pain persistence [11-12]. Existing studies provide evidence about some factors that can influence pain after cesarean section. For example, individual variation in postoperative pain intensity is influenced by multiple factors, including pain sensitivity, psychosocial factors [eg, anxiety level, physicalization], age, and genetics [13-14]. There are conflicting findings regarding the importance of preoperative patient education and

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information about the surgical procedure or preoperative local or systemic anesthesia and the pain catastrophizing scale in postoperative pain [15-18].

Also, the study results showed that almost half of the variability in pain measurements after cesarean section could be predicted by a set of variables that included anxiety, extraversion, depression, education level, previous chronic pain syndromes, and medication bias. [19]. In a study of multiparous women who underwent their second cesarean section, incisional pain was less in the first 48 hours after surgery compared with a primary delivery [20]. In another study, there was no significant relationship between the increase in pain score after injection of painkillers and acute pain after cesarean section. Still, there was a significant relationship with subacute pain after cesarean section [21].

In a systematic review and meta-analysis, the results showed that nine factors contribute to poor postoperative pain management. These factors include: young age, female gender, smoking, history of depression or anxiety symptoms, sleep disorders, high body mass index, presence of preoperative pain, preoperative painkillers [22]. Religious intervention and meditation can also be effective in postpartum pain [23].

The results of one study showed that a simple and rapid preoperative test is useful for identifying women who experience more pain after cesarean section [24]. Also, the results of another study showed that the electrical pain threshold can be used in personalizing the pain relief protocol. Useful after cesarean section [25]. In another study, the results showed that a significant combination of physical and psychological tests of the patient before surgery is a predictive model. It is valid for post-cesarean pain and the need for analgesia compared to individual predictor variables [26].

In another study, the results showed that optimal analgesia after cesarean section has a significant effect on recovery and outcomes after cesarean delivery [27]. In a Diggs clinical trial study conducted in Iran, the results showed that the type of anesthesia affects the intensity, amount of painkiller consumption, headache, nausea, and vomiting after the operation [28]. In another study conducted in Iran, the results showed that there is a relationship between anxiety and pain after cesarean section [29].

As a result, considering the high prevalence of cesarean section in the country and acute pain and the continuation of this pain after the operation, its impact on the quality of life of mothers and the essential role of mothers in child care and home and family management, it can be determined the effective factors in the occurrence of pain. Examined acute and adjusted these factors to improve the condition of mothers after cesarean section and took a step towards improving the health of the family.

Methods

In this study, all women over 18 years of age who were candidates for cesarean section with ASA 1 and ASA 2 spinal anesthesia and were admitted to Beheshti Hospital in Isfahan with informed consent were selected. Then, in the first stage, half an hour after entering the recovery room and in the second stage, 12 hours after the operation, the researcher visited the department to collect information and complete the questionnaire. In the demographic information questionnaire, age, education level, smoking, drug use, body mass index, history of previous abdominal surgery, number of cesarean sections, history of using painkillers for any reason, history of specific physical or mental illness, duration of surgery, number of people present in the operating room, emergency or elective surgery, type and dose of painkillers used for pain control, side effects of pain (increased blood pressure (more than or equal to 140/90 mmHg), increased heart rate (more than 100 beats per minute)), nausea, vomiting, and other symptoms) side effects of pain control (apnea (stopping breathing for 20 seconds or more during sleep), bleeding, hypoxia (blood oxygen percentage less than 90), bradycardia (heart rate less than 60 minutes), and others) were recorded. A numerical pain scale was used to measure pain intensity. This criterion had eleven numbers (from 0 to 10), based on which zero indicates no pain, numbers 1, 2, and 3 indicate mild pain, numbers 5 and 6 indicate moderate pain, and numbers 7, 8, 9, and 10 indicate They were very painful.

Results

In this study, 250 women with an average age of 31.74 years participated, and people between 33 and 39 years old with an average postoperative pain of 8.15 were most affected by postoperative pain (P value=0.01). 32 people (12.8%) were non-Iranian nationals and 219 people (87.2%) were Iranian nationals, and no significant difference in postoperative pain intensity was observed among them (P value=0.5). The average preoperative pain intensity in all participants was 2.98, which was associated with complications such as nausea, vomiting, and increased heart rate in 20% of the participants. The average pain intensity after the operation in all participants according to the numerical pain criterion shows the number 6.69, a sign of severe pain in these people after the operation and before the injection of painkillers, which is 2.7 in the recovery after the operation (Table 1).

16% of the participants were elective and 84% underwent emergency surgery, all of which were performed under spinal anesthesia. 66% of the participants did not have any underlying disease, and among those who had underlying disease,

hypothyroidism (57.33%) was the most common disease, followed by diabetes (23.77%) and high blood pressure (15 percent). In people with high blood pressure, the intensity of pain after surgery was significantly higher (P value=0.004).

Table 1- Demographic characteristics of mothers participating in the research

Variable	Number of samples	minimum	maximum	standard deviation ± mean
age (years)	250	19	45	31.74±4.2
height (cm)	250	145	181	171.5±6.9
weight (kg)	250	54	113	77.6 ±5.7
body mass index (kg/m 2)	250	17.43	35.71	26.57 ± 3.2
person in the operating room	250	3	9	6.41 ± 3
Preoperative pain intensity (cm)	250	0	10	3.02 ± 1.2
Postoperative pain intensity (cm)	250	2	10	6.8 ± 2.7
Pain intensity immediately after receiving painkillers (cm)	250	1.5	9	4.1±1.5
Pain intensity 12 hours after receiving painkillers (cm)	250	1.5	10	7.6 ± 2.2
Satisfaction with pain control (cm)	250	3.5	10	7.34±3.2

People (14%) were illiterate and the average pain intensity before the operation was 8.57 and after the operation was 4.73. 25 people (10%) had primary education, the average pain before surgery was 3.66, and after surgery was 5.86. 102 people (40.8%) had a diploma education and the average pain intensity before operation was 3 and after operation was 6.76. 10 people (4%) had postgraduate degrees and the average pain intensity before the operation was 2.4 and after the operation was 5.8. 48 people (19.2%) had a bachelor's degree or higher, and the average pain intensity before surgery was 3.06 and after surgery was 7.55. The level of education was not significantly related to the mean intensity of postoperative pain (P value=0.3). The average number of people in the operating room was 6.41, of which 107 people (42.8%) had 6 or less than 6 people in the operating room, and the average pain intensity before the operation in these people was 3.22 and after it was 6.03. 143 people (57.2%) had more than 6 people in the operating room and the average pain intensity before the operation in these people was 3.43 and after the operation was 7.18. A significant relationship was found between the number of participants and the average pain intensity after the operation (P value=0.002).

37 people (14.8%) of the participants had a history of previous surgery except cesarean, of which 13 people had appendicitis, 7 people had laparoscopy, 3 people had laparotomy, 3 people had cyst, 2 people had EP, 1 person had abdominoplasty. 1 person had endometriosis, 1 person had myomectomy and 6 people were unknown. The average pain intensity in these people was 2.98 and 7.43 after the operation. Except for cesarean section, the history of previous surgery had no significant relationship with the mean intensity of postoperative pain in mothers (P value = 0.3).

The average time spent in the current caesarean section in all patients was 73.52 minutes. Pain intensity based on the duration of cesarean section was such that 74 People (29.6%) had cesarean section for 30 to 60 minutes, and the average pain intensity before and after the operation was 3.22 in these people. It was 86.5. 144 people (57.6%) underwent cesarean section for 30 to 60 minutes, and the average pain intensity before the operation was 3.25, and after the operation was 6.9. 32 people (12.8%) underwent cesarean section for more than 90 minutes, and the average pain intensity before the operation was 4.03, and after the operation was 7.62. Other underlying diseases such as thalassemia, hepatitis, and epilepsy also make up the remaining 5%. 130 people (52%) of the participants had a BMI of 30 or higher and were in the category of obese people, the mean postoperative pain intensity was 6.98, which was significantly higher than those with a BMI of less than 30 (P value 0.002).

70.8% of the participants had a history of previous childbirth, 48% only had a history of cesarean delivery, 14.8% only experienced natural childbirth, and 8% had both natural childbirth and cesarean delivery experience, which was performed after the operation. Pain in people who had a history of natural childbirth was less than the other two groups (P value = 0.001) (Table 2).

Thirty-two percent of participants received no anesthesia, while 68% required intravenous anesthesia, the most common of which (98%) was pethidine at a mean dose of 58.2 mg, and 18.8% needed at least two intravenous anesthetics. They had intravenous or intramuscular injections or suppositories, and the most common intravenous drug was pethidine (90%), followed by intramuscular ketorolac (10%) with an average dose of 30 mg, which was less common, and the most common suppository was diclofenac suppository. (99.3%). The mean dose was 100 mg and 6% used diclofenac suppositories alone. The average pain intensity decreased to 3.84 after giving the participants painkillers. 12 hours after the operation and after transferring the participating

mothers to the ward, the average pain intensity increased to 7.3.

Table 2- The relationship between the variables and the average intensity of postoperative pain in the mothers participating in the research

Variable	Subgroup	Mean postoperative pain intensity ± standard deviation	Number of participants	Correlation	Sig	P value
Age (Years)	19-25	1.2 ± 6.22	70	-152.	220.	0.01
	26-32	0.8 ± 6.81	92	179.	201.	
	33-39	1.42 ± 8.15	73	999.	064.	
	40-45	0.6 ± 6.21	15	235.	126.	
BMI (kg/m 2)	>30	1.8 ±6.36	120	321.	153.	0.002
	≥30	1.45 ± 6.98	130	762.	048.	
Nationality	Iranian	0.8 ± 6.78	219	281.	193.	0.5
	Foreign	0.75 ± 6.38	32	517.	327.	
Education level	illiterate	1.1 ± 6.42	35	134.	062.	0.3
	elementary	0.7 ± 6.25	25	-324.	423	
	diploma	1.2 ± 6.37	102	176.	245.	
	postgraduate	0.9 ± 6.62	10	762.	176.	
	Bachelor's degree or higher	1.6 ± 6.83	48	543.	246.	
History of underlying disease	hypothyroid	1.3 ± 6.3	60	276.	054.	0.004
	high blood pressure	2.2 ±7.2	15	324.	129.	
	diabetes	0.5 ±2.7	29	175.	032.	
	Other diseases	0.8 ± 5.75	3	268.	234.	
	without disease	1.5 ± 6.87	142	481.	191.	
History of previous childbirth	NVD	2.2 ± 6.19	57	251.	099.	0.001
	cesarean	1.3 ±6.87	123	391.	162.	
	No history of childbirth	1.7 ± 6.52	70	128.	285.	
Previous Operation history	Appendicitis	1.45 ± 6.52	13	241.	329.	0.1
	Laparoscopy	2.1 ± 7.1	7	182.	173.	
	Other actions	1.4 ± 6.68	17	072.	286.	
	No record	0.8 ± 6.68	213	189.	387.	
People in the operating room	6 or less than 6 people	1.3 ± 6.03	107	521.	059.	0.002
	More than 6 people	0.85 ± 6.03	143	134.	285.	

Note – Data expressed as mean ± standard deviation.

Table 3- The relationship between painkillers and average pain intensity after surgery and after receiving painkillers in the mothers participating in the research (A= Mean pain intensity after surgery ± standard deviation, B=Mean pain intensity after receiving painkillers ± standard deviation)

Drug name	Mean dose	method of administration	Number of participants	A	B	Correlation	Sig	P value
Pethidine	50 mg	Intravenous	130	1.2 ± 7.12	1.3 ± 3.78	327.	068.	0.52
Ketorolac	30 mg	muscular	35	1.5 ± 5.6	2.2 ± 3.9	163.	251.	0.98
Diclofenac	100 mg	Suppositories	22	2.2 ± 7.26	2.5 ± 4.92	295.	196.	0.2
Apotel	1 gram	Intravenous	26	1.6 ± 4.91	1.3 ± 3.7	051.	222.	0.6
Petdin and Apotel	50 mg/1 gram	Intravenous/intravenous	22	3.3 ± 4.95	0.8 ± 3.22	291.	157.	0.03
Pethidine and diclofenac	50 mg/100 mg	Intravenous/suppositories	15	2.2 ± 8.7	1.5 ± 3.22	569.	962.	0.001

They were then given analgesia again, this time approximately 98% of patients were given diclofenac suppositories at a mean dose of 75 mg, after which the mean pain intensity decreased to 3.94. In general, the use of pethidine and diclofenac suppositories together more effectively and better but temporarily reduced the intensity of postoperative pain in these people (P value=0.001). The level of satisfaction with pain control among the participants It was 7.34 out of 10 (Table 3).

Discussion

This study aimed to investigate the level of discomfort after cesarean 24 hours later. The results showed that 80% of patients experienced moderate to severe pain within 24 hours after surgery. 91.7% of deliveries reported moderate to severe pain at 12 hours, while 84.2% reported severe pain at 24 hours. This result was consistent with the research of Brazil [30], Gondar [31], and Jima [32]. The study area and the time of pain assessment may be the cause of the variations. However, this result is higher than research conducted in Uganda [33], Brazil [34], South Africa [35], Sweden [36], Singapore [37] and Palestine [38]. Lack of focus on pain management and the availability of strong painkillers to treat post-operative pain can be the cause.

Postoperative pain is related to the duration of surgery. Compared to deliveries whose treatment lasted less than an hour, those whose procedures lasted more than 60 minutes were 3.62 times more likely to experience moderate to severe postoperative discomfort. This result was consistent with research conducted in Singapore [39]. This may be explained by the long and challenging process, the presence of intraoperative problems that affect postoperative pain, the surgeon's experience, excessive manipulation of intra-abdominal organs, tissue trauma, and most likely increased surgical stress on the body.

Postpartum pain in our study did not have a uniform relationship with increasing age, but the highest amount of this pain was in the age range of 33 to 39 years, which is in line with previous studies [40-42] that the age range of 30 to 40 years has the highest amount of pain after surgery. They knew that childbirth was compatible. Also, in some studies, they did not find a relationship between age and the amount of pain after childbirth [43-44]. Also, in this study, with increasing BMI, the intensity of pain after cesarean delivery increased, which was found in a study by Jin et al. [45].

In our study about the analgesics used after cesarean section, diclofenac, and pethidine suppositories were the most effective analgesics to reduce postoperative pain. In this context, Akhwan Akbari and colleagues in a study in 2013 investigated the effect of different pain relievers in reducing pain after cesarean section [46]. In their study, the pain score in the acetaminophen group was higher than pethidine and diclofenac. The difference between diclofenac and pethidine was significantly higher (P value < 0.001). In their study, due to the significant reduction in pain scores and opioid consumption, especially in the indomethacin and diclofenac groups compared to the control group, the use of indomethacin and diclofenac suppositories was suggested for analgesia after cesarean section. Considering this issue, the diclofenac suppository can be the most effective pain reliever to reduce pain after a cesarean section.

To help health care institutions that provide cesarean section services and related pain management provide appropriate management guidelines, the results of this study are expected to provide insight into the extent of postoperative pain in post-cesarean patients and whether their pain is Sufficient as a resource for further research into the practice of pain treatment. Management can provide or not.

Conclusion

Within 24 hours after cesarean section, a significant percentage of pregnant women in this study reported moderate to severe discomfort. It was found that the pain after cesarean section is significantly related to the length of the operation, the type of anesthesia used, and the type of painkillers given. When resources are limited, the focus should be on implementing pain reduction strategies and efforts to manage pain postoperatively.

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