Original Article

Factors Affecting Intensity of Post-Operative Pain After Caesarean Section Under Spinal Anaesthesia

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Abstract

Objective: This study aims to investigate the factors influencing the intensity of post-operative pain following caesarean section under spinal anesthesia

Methodology: This prospective observational study was carried out at PAF Hospital Faisal Base, Karachi, from 06-Feb-2024 to 06 Aug-2024, included 270 patients who underwent elective or emergency C-section under spinal anesthesia. The Visual Analogue Scale (VAS) was used to describe intensity of pain at 2, 12, and 48 hours after surgery. Data was analyzed using SPSS version 23. A p-value < 0.05 was considered significant.

Results: Among all the variables, significant observation identified in the pain intensity based on parity (P=0.034), labour phase (P=0.04), indication of surgery ie failure to progress (P=0.032), duration of surgery (P=0.034) and incision length (P=0.023). While type of surgery (0.073) dose not affect upon intensity of post-operative pain. This study invites us to think about broader perioperative assessments of patients submitted for caesarean section and development of clinical tool for appropriate guidelines for satisfactory postoperative pain management, which is one the contributing factor for postoperative quality care.

Conclusion: This study demonstrates higher score of postoperative pain associated with the factors like higher parity, active phase of labour, emergency C-section, longer duration of surgery and incision length of more than 10 cm. There is a need to evaluate other factors contributing intensity of postoperative pain for the provision of better health care.

Keywords: post-operative pain intensity, caesarean section pain

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Introduction

Caesarean section is the most common surgery in the field of obstetrics and gynaecology.[1] Pain is a very common symptom which needs attention, and its effective management is a demanding experience for the health care professionals.[2] It is reasonable to identify the factors and management strategies affecting the intensity of pain, particularly in the context of standardized analgesic and anaesthetic regimens, which are one of the key elements of Enhanced Recovery After Surgery (ERAS) protocols.[3]

Labour pain is an inherent aspect of childbirth, where its management poses a significant challenge for both obstetricians and expectant mothers, necessitating effective and personalized care.[4] Childbirth is a personal experience[5,6], and fear of labour pain and its unbearable experience lead the expectant mothers to

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prioritize caesarean section over normal vaginal delivery, which is also increasing the rate of caesarean sections.[7,8]

In the post-operative period, pain is an almost crucial symptom to be addressed[9]. Morbidities like poor wound healing, ineffective breastfeeding, delayed recovery, prolong hospital stay, physical discomfort, poor quality of life, and chronic pain are the result of moderate to severe post-operative pain.[10,11] It is controlled by sensory, affective cognitive, sociocultural and behavioral aspect of human.[10,11] Along with psychological aspect where anxiety and depression increases the post-operative pain intensity, pain reduces the blood flow towards breast interfering breastfeeding[11]. Intensity of pain equal to or higher than five (5) interferes with daily activities, need for potent analgesic use, increased patient anxiety and psychological burden which interfere with relationship of lactating mothers and effective care of new born resulting burden on patient attendants and health care professionals.[12,13.] Postoperative pain results morbidities and even death in severe cases if remain untreated[14.] Our study aim to investigate the factors affecting intensity of postoperative pain after caesarean section specially age, parity, type of surgery, length of incision, phase of labour so that effective postoperative pain management chalked out for improved quality of care.

Methodology

This prospective observational study was carried out at PAF Hospital Faisal Base, Karachi, from 06 Feb 2024 to 06 Aug 2024. After obtaining a sample size of 270 patients and obtaining ethical approval, all patients who underwent caesarean section and who gave consent for their enrolment in study were included. All participants were asked for verbal consent. Patients who did not give consent, had language issues, or experienced intraoperative complications were excluded. Clinical and demographic data were collected through a questionnaire. Length of incision was measured by a simple ruler in centimeters following 24 hours of surgery. Pain was measured by using the Visual Analogue Scale (VAS) at 2, 12, and 24 hours of surgery.

The scale ‘0’ means no pain, ‘0–3’ means mild pain (can be ignored), ‘4–6’ means moderate pain (interferes with tasks), while ‘7–10’ means severe pain (interference with basic needs and bed rest is required)

Descriptive statistics were calculated for all variables, which included age, parity BMI, type of surgery, duration of surgery, labour phase, indication of surgery, incision length. Chi-square test and Student t-test were used for qualitative and quantitative variables accordingly. Data were analyzed by using SPSS version 23, and a p-value of < 0.05 was considered as statistically significant

Results

A total of 270 parturient were included in study. The majority of caesarean section patients were young adults with normal BMI index. The age range between less than 20 and greater than 40 years, where most of the parturient were within 20 - 25 years of age (50.5%) followed by age of 5 – 30 (15.3%). The most common BMI among the studied patient was 26 – 30 about 42.3%. About 124 (55.9%) of multipara patients went through C-section, the number is increased due to repeated C-section, while primiparity as 98 cases (44.1%). Elective surgeries were more common than emergency C-section. Elective surgeries accounts for 118 (53.2%) while 103 cases (46.4%) as emergency C-section. Majority of surgeries carried out before labour 52.3%. This is due to repeated C-section as 36.0%, malpresentation 12.6% and maternal request 9.9%. About 29 (13.1%) caesarean section carried out in latent phase, while 77 about 34.7% carried out as emergency while 51 cases (23%) cases landed as fetal distress and 28 cases (12.6%) caused by failure to progress. Surgeries were of short duration 107 cases 48.2% was found less than 30 minutes of duration, 52 cases (28.4%) between 30 to 60 minutes and 52 cases (23.4%) duration was greater than 30 minutes. Incision length typically less than 10cm found in 126 cases (56.8%) while 96 cases (43.2%) length was more than 10cm. (Table I)

According to study the mean minimum pain score was 5.18 at 2 hour post caesarean section while 6.58 mean found as mean maximum pain score. (Table II)

After 12 hours mean minimum pain score was 2.89 while mean maximum pain was 4.14. The score further decreases to mean minimum pain score 0.841 while mean maximum pain score was 1.75 after 24 hours of caesarean section. (Table II)

Among all the variables, significant difference was observed in the pain intensity based on parity (P=0.034), type of surgery (P=0.073), labour phase (P=0.04), indication of surgery ie failure to progress

(P=0.032), duration of surgery (P=0.034) and incision length (P=0.023). (Table III)

Table I: Demographic information of caesarean section patients.

Demographic Characteristics		N	%
Age	Less than 20 years	26	11.7
	20-25	112	50.5
	25-30	34	15.3
	31-35	30	13.5
	36-40	19	8.6
	Greater than 40 years	1	.5
BMI	Less than 18.5	19	8.6
	18.6-25	48	21.6
	26-30	94	42.3
	31-35	50	22.5
	36-40	11	5.0
	Greater than 40	222	100.
Parity	Primigravida	98	44.1
	Multigravida	124	55.9
Type of Surgery	Elective	118	53.2
	Emergency	103	46.4
Labor phase	Before Labor	116	52.3
	Latent Phase	29	13.1
	Active Phase	77	34.7
Education	Illiterate	72	32.4
	Primary	48	21.6
	Secondary	75	33.8
	College and above	27	12.2
Indication of Surgery	Failure to progress	28	12.6
	Fetal Distress	51	23.0
	Repeat C-Section	80	36.0
	Malpresentation	28	12.6
	Multiple pregnancy	13	5.9
	Maternal request	22	9.9
Duration of Surgery	Less than 30 minutes	107	48.2
	30-60 minutes	63	28.4
	Greater than 30	52	23.4
Length of Incision	Less than 10 cm	126	56.8
	More than 10 cm	96	43.2

Discussion

Post-operative pain not only affects the psychology of the patient but also reduces the blood flow towards the breast and interferes with breastfeeding practices, ambulation, and care of the newborn, resulting in psychological burden upon the family and healthcare staff.[11, 12] Therefore, pain management by analgesic modalities is a universal concern and considered a basic human right[13]. International journal of Anesthesiology and Obstetrician by Sun et al(2019)mentioned the incidence, pathophysiology and risk factors affecting pain after c section, which was divided into 3 categories. First preoperative risks which are anxiety, preoperative depression, request of caesarean section, low socioeconomic status, low BMI.

Table II: Descriptive examination of average pain intensity at different hours after surgery in patient

	Min	Max	Mean	SD
Minimum Pain score after 2 hours posts C-section	2.00	8.00	5.185	1.503
Maximum Pain score after 2 hours posts C-section	1.00	9.00	6.583	1.479
Minimum Pain score after 12 hours posts C-section	.00	6.00	2.895	1.304
Maximum Pain score after 12 hours posts C-section	.00	8.00	4.149	1.510
Minimum Pain score after 24 hours posts C-section	.00	4.00	.841	.908
Maximum Pain score after 24 hours posts C-section	.00	5.00	1.754	1.140

Table III: Investigation of factors affecting pain after caesarean section (24 hours)

		N	Mean	SD	P Value
Age	Less than 20 years	24	1.083	.282	.243
	20-25	95	1.084	.279	
	25-30	30	1.166	.379	
	31-35	27	1.074	.266	
	36-40	17	1.117	.332	
	Greater than 40 years	11	1.090	.301	
BMI	Less than 18.5	17	1.000	.000	.970
	18.6-25	44	1.090	.290	
	26-30	82	1.073	.262	
	31-35	40	1.200	.405	
	36-40	11	1.090	.301	
	Greater than 40	194	1.097	.000	
Parity	Primigravida	85	1.082	.276	.034
	Multigravida	109	1.110	.314	
Type of Surgery	Elective	98	1.081	.276	.738
	Emergency	95	1.115	.314	
Labor Phase	Before Labor	97	1.082	.2761	.04
	Latent Phase	26	1.153	.367	
	Active Phase	71	1.098	.300	
Education	Illiterate	66	1.090	.28	.721
	Primary	41	1.048	.218	
	Secondary	64	1.109	.314	
	College and above	23	1.173	.387	
	No	69	1.101	.304	
Indication of Surgery	Failure to progress	25	1.080	.276	.032
	Fetal Distress	48	1.041	.201	
	Repeat C-Section	69	1.101	.304	
	Malpresentation	25	1.080	.276	
	Multiple pregnancy	12	1.333	.492	
	Maternal	15	1.133	.351	

	request				
Duration of Surgery	Less than 30 minutes	97	1.041	.199	.011
	30-60 minutes	53	1.113	.319	
	Greater than 30	44	1.204	.408	
Length of Incision	Less than 10 cm	116	1.086	.281	.0230
	More than 10 cm	78	1.115	.321	

Second, risk factors during surgery like incision length, duration of surgery, anesthesia type means general or spinal anesthesia, use of morphine and dose of medicines. Third, postoperative risk factors like pain and depression.[11]

In our study, the magnitude of moderate to severe postoperative pain at 2 hours post-C-section, both minimum and maximum pain scores are higher, with means of 5.1855 and 6.5837, for minimum and maximum pain scores, respectively. By 12 hours, these scores decrease to means of 2.8969 and 4.1493 for minimum and maximum pain scores, respectively. At 24 hours, the pain scores further decrease, with means of .8416 and 1.7545 for minimum and maximum pain scores, respectively. While the findings Demelash et al[10]suggests the prevalence of moderate to severe pain in the first 24 hours was 85.5%, where 75.5% of patients experienced moderate to severe pain at the second postoperative hour, 80% at the 12th hour, and 58.6% at the 24th hour.[10] These findings are also consistent with studies carried out by Jimma[15] and Brazil.[16] However, our findings are higher than those from Palestine[17], Brazil[18], South Africa[19], and Sweden[20], where minimum pain score after 2 hrs SD 1.5, after 12 hrs 1.4, after 24 hrs 0.9 while maximum pain score after 2 hr SD 1.4, after 12 hrs 1.5, after 24 hrs 1.1. The inconsistency may be due to differences in population and study area. We used the Visual Analogue Scale (VAS) in our study, while others used NRS-11 for pain quantification. Furthermore, there could be ignorance or underrating of pain management.

Medical staff and patients often express uncertainty regarding the use of opioids after C-section due to concerns about possible safety risks and their impact on breastfeeding newborns. This is a factor responsible for inadequate postoperative pain relief in the female population.[21] National Institute for Health and Care Excellence (NICE) guidelines for C-sections[22]recommend utilization of opioids in addition to scheduled non-opioid, same as PROSPECT (Procedure-Specific Postoperative Pain Management) working group of European society of regional anesthesia and pain therapy.[23] Due to excellent and prolonged (14-36hrs) postoperative analgesic affects, intrathecal morphine use is a gold standard treatment by sultan et al[24], NICE guidelines[22], American guideline for obstetrics anesthesia.[25]

Polypharmacy, underuse of efficient analgesic modalities, and inappropriate patient assessment are identified as major challenges. A study conducted in Denmark emphasized that early administration of analgesics (within 3 hrs post-operatively) resulted in improved pain control and better breastfeeding practices.[20] Despite modern advances, many patients still report inadequate pain relief. NICE guidelines stress the importance of early mobilization and a combination of education and multimodal analgesia.[22]

Delayed pain relief during delivery not only affects physical recovery but also influences the rate of future C-sections. Studies show that women who had a traumatic pain experience in the process of normal vaginal delivery, are more likely to opt for elective caesarean section in subsequent deliveries. In our study the patient who have emergency C-section have high score of postoperative pain as compared to elective C-section (P=0.783) especially patient with indication of failure to progress labour (P=0.032) have higher score of post-operative pain. Hence, effective pain management strategies after C-section not only improve recovery but also reduce future surgical demand. Every woman encounters varying levels of post-operative pain due to different risk factors, including age, BMI, comorbidities, anxiety, and individual pain thresholds.[9,10] Demelash et al suggested that parturient having preoperative anxiety are 2.3 times more likely to experience moderate to severe postoperative pain[10], while one study at Brazil revealed 1.6 times in anxious mothers.[16] In our study duration of surgery has also impact upon the intensity of pain. Patient experience higher score of postoperative pain who has longer duration of surgery (P=0.01). Identifying these individual factors and providing personalized care is essential while managing postoperative patients.

Length of incision affects the pain intensity[11], incision length in not recommended by NICE guidelines.[26] Parturient who have more than 10 cm incision length have more tissue damage, nerve injury so increase in intensity of pain.[10, 11, 12, 16] However recent studies reveals that extra peritoneal French ambulatory cesarean sections technique not only reduces the pain intensity but fastened recovery, reduces intrauterine

infection, thus the technique should be widely used in current environment where the rate of cesarean section is rapidly increasing.[27] In our study the length of incision have a significance affect on postoperative pain (P=0.023) (Table III).

Timely assessment and management of post-operative pain with evidence-based practices is the only way to reduce poor patient experience. The present study highlights the need to educate both patients and healthcare providers regarding the importance of pain control. Future methodology must focus on evaluating predictors of pain perception and developing standardized guidelines for appropriate pain relief protocols, especially in low-resource settings. Such steps are essential for combating poor quality care.

Limitation of study: This study was single center based which was the main limitation of our study, ultimately it limits generalizability because of convenience sampling method used. Multi center studies are required about this clinical aspect. Further factors need to be evaluated for the development of standardized postoperative care.

Conclusion

Timely assessment and management of post-operative pain with evidence-based practices is the only way to reduce poor patient experience. The present study highlights the need to educate both patients and healthcare providers regarding the importance of pain control. Future methodology must focus on evaluating predictors of pain perception and developing standardized guidelines for appropriate pain relief protocols, especially in low-resource settings. Such steps are essential for combating poor quality care.

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