THE CAUSES OF INTRAOPERATIVE PAIN AMONG ELECTIVE CAESAREAN SECTION PATIENTS UNDER SUB-ARACHNOID BLOCK AT THE 37 MILITARY HOSPITAL

ABSTRACT

Background: Elective Caesarean section (CS) is a frequently conducted surgical surgery on a global scale, with varied rates across different countries. Possible causes of intraoperative pain following caesarean section under spinal anaesthesia have been proposed. The potential consequences include inadequate anaesthesia, nerve injury during needle insertion, manipulation of internal organs during surgery, and psychological factors such as anxiety and fear. This study was conducted to assess the causes of intraoperative pain among patients undergoing elective caesarean section under sub-arachnoid block at the 37 Military Hospital, Accra, Ghana.

Methods: A descriptive cross-sectional research design was employed in this study. A total of 55 women who have had elective caesarean section under sub-arachnoid block were selected for the study. Data was collected using a structured questionnaire and analysed with the SPSS.

Results: Findings from the study showed a high incidence of intraoperative pain among women during elective caesarean section under sub-arachnoid block (96.4%). These were mainly sharp and aching pain. However, the levels of the pain experienced intraoperative were mild (52.7%) and moderate (43.6%). Increased length of time spent during surgery and ineffectiveness of medications/ injections given to prevent pain were the main factors contributing to intraoperative pain among patients during elective caesarean section under sub-arachnoid block.

Conclusions: Intraoperative pain in elective caesarean section patients under subarachnoid anaesthesia is influenced by a combination of physiological, psychological, surgical, and patient-related factors. To mitigate intraoperative discomfort and enhance the overall surgical experience for patients having elective CS, it is crucial to address these issues by employing optimised anaesthesia techniques, implementing effective pain management measures, and utilising preoperative psychological therapies.

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Key Words: ***Intraoperative, caesarean section, sub-arachnoid, pain management, surgical***

INTRODUCTION

Caesarean section is the use of surgery to deliver one or more babies. A Caesarean section is often performed when vaginal delivery is not possible or would put the baby or mother's life at risk (Women's Health, 2010). In this study , it was found out that these indications included but not restricted to obstructed labour, twin pregnancy, high blood pressure in the mother, breech presentation of the baby, problems with the placenta, umbilical cord or shape of the pelvis, and previous Caesarean section. Some Caesarean sections are also performed upon request by the mother (Women's Health, 2010). The procedure typically takes forty-five minutes to an hour. Usually an incision of about 15 cm (6 inches) is made through the mother's lower abdomen during a caesarean section to deliver the baby.

Elective Caesarean section (CS) is a frequently conducted surgical surgery on a global scale, with varied rates across different countries. CS rates in certain areas go as high as 40%, beyond the recommended level of 10-15% set by the World Health Organisation. A substantial proportion of individuals with CS have elective treatments using sub-arachnoid anaesthesia (SA). Although spinal anaesthesia (SA) is generally regarded as a safe and effective method for administering anaesthesia during caesarean section (CS), the issue of intraoperative pain still worries many patients. Experiencing pain during caesarean section surgery can cause significant suffering and potentially result in heightened maternal anxiety, discomfort, and unhappiness with the overall delivery process. Additionally, it can lead to physiological reactions such as heightened heart rate and blood pressure, which might potentially impact the health of both the mother and the foetus (Smith, et al., 2020). The precise aetiology of intraoperative pain in elective caesarean section patients under spinal anaesthesia remains uncertain, despite advancements in anaesthesia procedures and perioperative care. Various factors have been suggested as potential triggers of intraoperative pain during caesarean section under spinal anaesthesia (Smith, et al., 2020). The potential complications encompass insufficient anaesthesia, nerve damage during needle insertion, manipulation of internal organs during surgery, and psychological elements such as anxiety and dread. Gaining a comprehensive understanding of

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these characteristics is essential for strengthening the treatment of pain during surgery and improving the overall birthing experience for individuals who choose to have a caesarean section (Smith, et al., 2020).

Intraoperative pain during elective CS is influenced by various elements, including as physiological, psychological, and environmental aspects. Physiological factors, like the location of the incision, the kind of surgery, and the individual's pain tolerance, can all impact the intensity of pain that patients feel. Psychological variables, including anxiety, fear, and past traumatic birth encounters, can also influence the way pain is perceived (Smith, et al., 2020). Moreover, the patient's perception of pain during CS can be influenced by environmental factors such as effective communication and support from the surgical team, as well as the accessibility of pain management measures. Although there have been improvements in anaesthesia and surgical methods, intraoperative pain continues to be a substantial problem for many elective caesarean section patients (Smith, et al., 2020).

Molina et al. (2015) found out that in 2012, about 23 million caesarean sections were done globally. The international healthcare community has previously considered the rate of 10% and 15% to be ideal for caesarean sections (Lauwers & Swisher, 2010). However, Molina et al. (2015) concluded that a rate higher than 19% may result in better outcomes. More than 45 countries globally have Caesarean section rates less than 7.5% while more than 50 have rates higher than 27%. There are efforts to both improve access to and reduce the use of Caesarean section (Molina et al., 2015). In the United States about 33% of deliveries are by Caesarean section (Women's Health, 2010). Caesarean section may be done with a sub-arachnoid block so that the woman is awake or under general anaesthesia.

Sub-arachnoid block, also called spinal block, intradural block and intrathecal block (Bronwen & Kathleen, 2011) is a form of regional block involving the injection of a local anaesthetic into the subarachnoid space. The spinal anaesthesia is the technique of choice for caesarean section as it avoids a general anaesthetic and the risk of failed intubation. It also means the mother is awake and the partner could be present at the birth of the child. The sub-arachnoid block offers post-operative analgesia with the addition of intrathecal opioids in addition to non-steroidal anti-inflammatory drugs.

Both general and regional anaesthesia (spinal, epidural or combined spinal and epidural anaesthesia) are acceptable for use during Caesarean section. Regional anaesthesia is preferred as it allows the mother to be awake and interact immediately with her baby (Hawkins, Koonin, Palmer & Gibbs, 1997). Other advantages of regional anaesthesia include the absence of typical risks of general anaesthesia. These risks include pulmonary aspiration (which has a relatively high incidence in patients undergoing anaesthesia in late pregnancy) of gastric contents and oesophageal intubation (Afolabi, Lesi & Merah, 2006). Regional anaesthesia is used in 95% of caesarean deliveries, with sub-arachnoid block and combined spinal and epidural anaesthesia being the most commonly used regional techniques in scheduled Caesarean section (Bucklin, Hawkins, Anderson & Ullrich, 2005). Regional anaesthesia during Caesarean section is different from the analgesia used in labour and vaginal delivery. The pain that is experienced because of surgery is greater than that of labour and therefore requires a more intense nerve block.

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This thesis seeks to investigate the underlying factors contributing to intraoperative pain in elective caesarean section (CS) patients under spinal anaesthesia (SA). The primary objective is to identify potential risk factors and devise effective ways for the prevention and management of this pain. By acquiring a more comprehensive comprehension of the factors that contribute to intraoperative pain, medical professionals can devise more efficient pain management techniques and improve the entire delivery experience for women undergoing elective caesarean sections.

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MATERIALS AND METHODS

Study design: This study utilised a descriptive cross-sectional research approach. Descriptive designs, as stated by Burns and Grove (2005), serve the purpose of elucidating a phenomenon within an authentic context. Furthermore, it facilitates the process of drawing broader conclusions from the obtained results. The chosen design will be used to evaluate the factors contributing to intraoperative discomfort in patients who are undergoing elective caesarean section under a sub-arachnoid block at the 37 Military Hospital.

Study Setting: The research was carried out at the Obstetrics and Gynaecology department of the 37 Military Hospital. ~~The 37 Military Hospital was founded and commenced operations on July 4th, 1941 by the colonial authorities in the midst of the Second World War. The name "37" was~~

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~~chosen because it signifies that it was the 37th General Hospital in the British Empire. Since then, it has evolved into a tertiary institution and a Post-Graduate Training Hospital~~. The hospital is a 400-bed facility located in the centre of Accra, serving a combined workforce of almost 7000 military and civilian personnel.

The hospital is comprised of various units and departments, including Medical, Surgical, Obstetrics and Gynaecology, Dental, Ophthalmology, Post-Graduate School, Paediatrics, Veterinary, Nurses Training College, Physiotherapy, Radiology/Magnetic Resonance Imaging, Public Health, Anesthesia/Intensive Care Unit, Health Information System, Neuro Surgical, Ear, Nose and Throat (ENT), Medical Electronic/ Light Aid Detach, Pharmacy (Chemist, Medical store and equipment depot), National Accident/ Emergency centre, Polyclinics, Pathology, Dietetics, Laundry unit, Transport unit, and the Engineer Detachment. The hospital comprises 18 wards and has a nursing staff of 840. The institution presently employs 37 anaesthetists, 11 scrub nurses, and 16 surgeons.

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Population: The study focused on patients who were receiving care at the Obstetrics and Gynaecology Unit of the 37 Military Hospital.

Inclusion criteria: The inclusion criteria include of women who underwent elective caesarean section with a sub-arachnoid block.

Exclusion criteria: The study excluded women who had undergone elective caesarean section deliveries without sub-arachnoid block.

Sampling Technique and Size: The study employed the approach of convenient sampling to select the subjects. The convenient sampling method is a type of non-probability sampling approach where respondents who are readily available and willing to participate in the study are picked. The selection criteria for this study were choosing exclusively women who had undergone elective caesarean section deliveries under sub-arachnoid block. These women were specifically from the obstetrics and gynaecology unit and were present during the data collecting period. Additionally, they expressed their willingness to participate in the study. The study included a sample size of 55 women who underwent elective caesarean sections under sub-arachnoid block.

Data Collection Instrument: A self-administered structured questionnaire was designed and utilised to collect data. The survey consisted of three distinct portions. The initial portion encompassed the demographic characteristics of the participants, such as their age, religion, marital status, parity, and level of education. The second and third portions focused on the occurrence of pain after elective caesarean section under sub-arachnoid block and the factors that contribute to this discomfort.

Data Collection Procedure: The study obtained ethical clearance from the ethical review board of the 37 Military Hospital. Official consent was also obtained from the administration of the 37 Military Hospital and the officer responsible for the obstetrics and gynaecology unit in order to enroll participants for the study. The personnel at the obstetrics and gynaecology unit assisted the researcher in identifying eligible female participants for the study and facilitated the researcher's introduction to these individuals. Subsequently, the women were notified on the study. Each individual who agreed to participate was provided with a questionnaire to complete and given sufficient time to return it once finished. They were also notified of their right to decline to complete the questionnaire or any specific question(s). To maintain anonymity, the names of the respondents were omitted from their questionnaires. Individuals who were unable to finish the questionnaire were given permission to submit it on the subsequent day. This was done to provide them with sufficient time to finish the questionnaire. Individuals lacking literacy in the English language had their inquiries read out to them and their answers documented.

Data Analysis: It involved inputting the questionnaire responses into the SPSS (version 16.0) software, following the coding of the individual items. Subsequently, a descriptive analysis was conducted, and the findings were displayed through frequency distribution tables, pie charts, and bar graphs.

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Ethical issues: To guarantee ethical standards in research, all participants were adequately informed about the study. Prior to administering the questionnaires, written informed consent was obtained from all participants. Participation in the study was voluntary for all individuals. The questionnaires were distributed to the participants individually to guarantee confidentiality. The participants were informed that they had the freedom to withdraw from the study at any moment, without providing any explanations, if they had personal reasons to discontinue. In order to maintain the anonymity of their responses, it was not necessary for them to provide their

names or any kind of identification on the questionnaire. To maintain confidentiality, the completed surveys were securely stored and only accessible to the researcher and their supervisor.

Validity and Reliability: Validity refers to the degree to which a test accurately measures the specific construct it is intended to measure (Winer, Brown & Michels, 1991). To ensure validity, the questionnaire was specifically created to encompass all topics related to the study's aims. Additionally, the task was completed with the assistance of a specialist and in collaboration with the supervisor. Reliability refers to the extent to which a test consistently measures the specific construct it is intended to measure (Winer et al., 1991). To verify accuracy, a pre-test of the questionnaire was conducted on five surgical staff members at the 37 Hospital. Subsequently, the replies were evaluated and any questions that were unclear or open to interpretation were restated in a more precise manner.

RESULTS

Introduction

The results from analysis are presented in this section. This has been organized according to the objectives of the study.

Demographic data

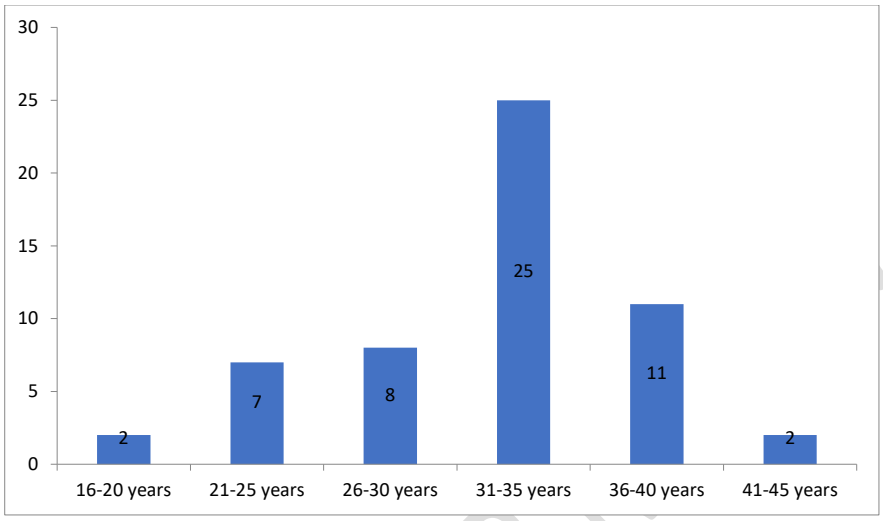

Figure 1: Age distribution of respondents

Figure 1 above shows that most, 25 (45.5%) of the respondents were 31-35 years old and 11 (20%) were 36-40 years old. The rest were 26-30 years old, 8 (14.5%), 21-25 years old, 7 (12.7%) 16-20 years old, 2 (3.6%) and 41-45 years old, 2 (3.6%).

Table 1: Marital Status of respondents

Marital status	Frequency	Percent
Married	32	58.2
Single	13	23.6
Divorced	6	10.9
Widowed	2	3.6
Cohabiting	2	3.6
Total	55	100.0

Table 1 shows that more than half, 32 (58.2%) of the respondents were married and about a quarter, 13 (23.6%) were single. The rest were divorced, 6 (10.9%), widowed, 2 (3.6%) and cohabiting, 2 (3.6%).

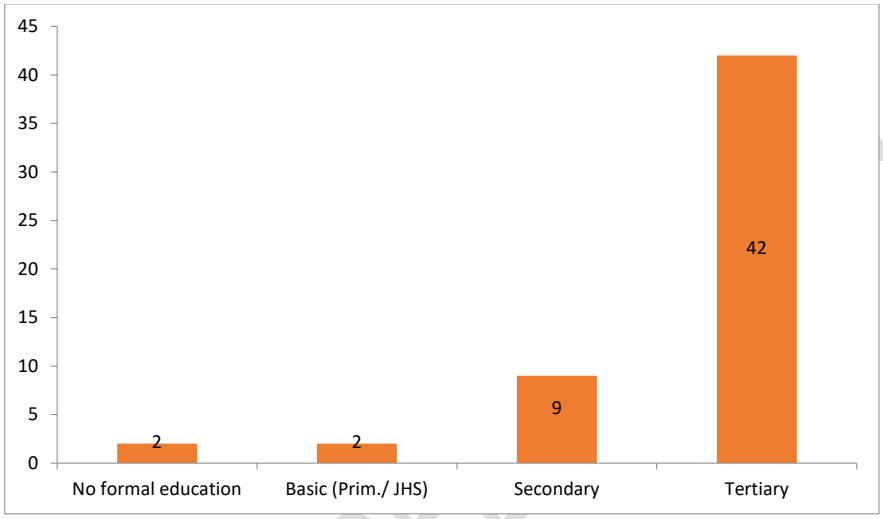

Figure 2: Level of Education of Respondents

As shown in Figure 2, majority, 42 (76.4%) of the respondents had tertiary education and 9 (16.4%) had secondary education.

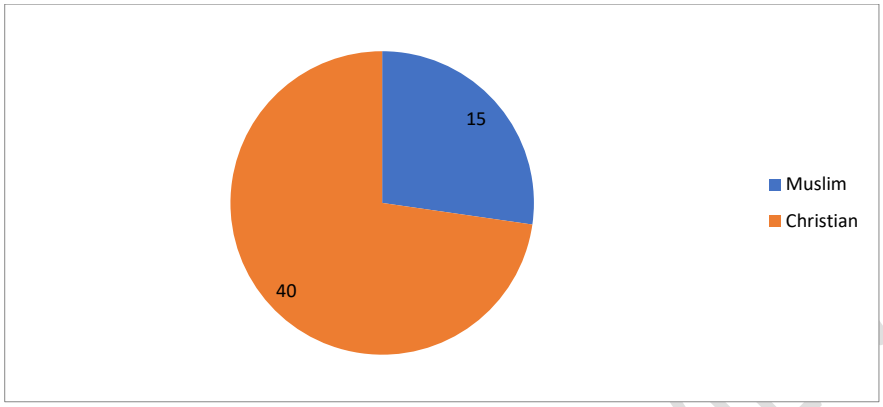

Figure 3: Religion of Respondents

Majority, 40 (73%) of the respondents were Christians and 15 (27%) were Muslims. This is illustrated in Figure 3 above.

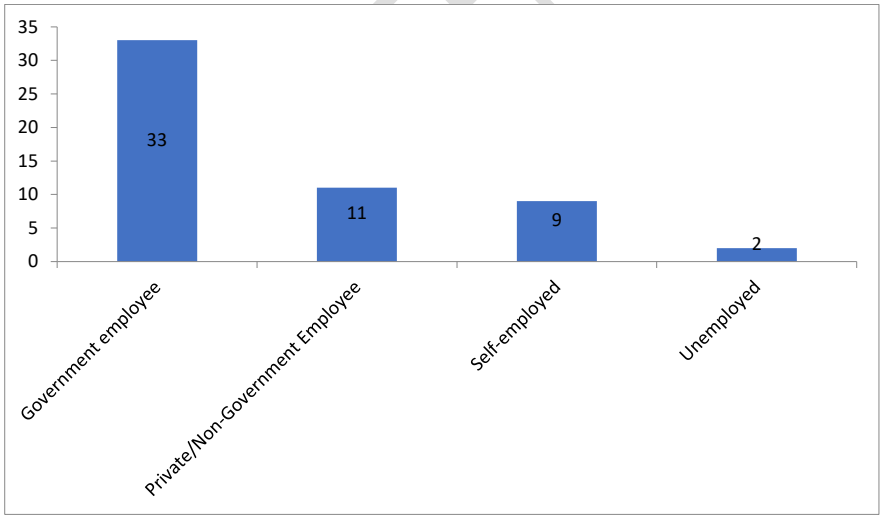

Figure 4: Employment Status of Respondents

It can be seen from Figure 4 that 33 (60%) of the respondents were government employees. However, 11 (20%) were private/ non-governmental employees, 9 (16.4%) were self-employed and 2 (3.6%) were unemployed.

4.2 Incidence of intraoperative pain

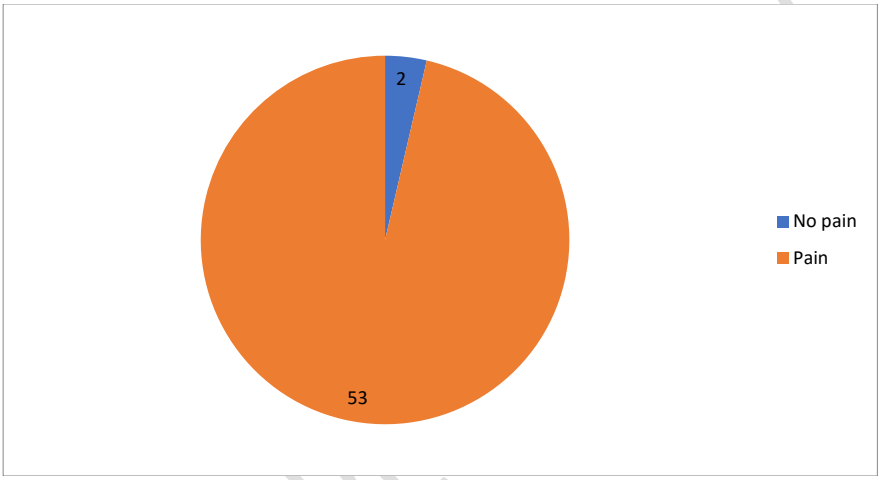

Figure 5: Incidence of Intraoperative Pain

As shown in Figure 5 above, majority, 53 (96.4%) of the respondents experienced some form of pain during elective caesarean section under sub-arachnoid block. Just a few 2 (3.6%) reported no pain.

Table 2: Types of Intraoperative Pain

Type	Minimum	Maximum	Mean	Std. Deviation
Throbbing	0	2	.71	.809
Shooting	0	3	.49	.791
Sharp	0	3	1.47	.997
Stabbing	0	3	.78	.956
Cramping	0	3	.82	.819
Gnawing	0	2	.56	.688
Hot-burning	0	3	.93	.997
Aching	0	3	1.24	.816
Splitting	0	3	.78	.875

Sharp pain (π= 1.47, SD= 0.99) and Aching pain (π= 1.24, SD= 0.99) were the common types of pain experienced by the respondents who felt pain during the procedure. This is shown in Table 2 above.

Level of intraoperative pain

Table 3: Level of Intraoperative Pain

Level	Frequency	Percent
No pain	2	3.6
Mild pain	29	52.7
Moderate pain	24	43.6
Total	55	100.0

The level of intraoperative pain experienced during elective caesarean section under sub-arachnoid block was mainly mild pain, 29 (52.7%). However, 24 (43.6%) of the respondents also experienced moderate intraoperative pain.

Factors contributing to intraoperative pain among patients during elective caesarean section under sub-arachnoid block

Table 4: Contributory factors contributing in Intraoperative Pain

Factors	Minimum	Maximum	Mean	Std. Deviation
Poor anaesthetic assessment/education before the surgery	1	3	1.62	.680
Ineffectiveness of medications/ injections given to prevent pain	1	3	2.00	.667
Not enough medications/ injections given to prevent pain	1	3	1.89	.567
Too many attempts on injection at the back before surgery	1	3	1.76	.793
Long time spent during surgery.	1	3	2.05	.756
Too much pulling by the surgeon	1	3	1.84	.631
Lack of experience by the surgeon	1	3	1.51	.791
Uncomfortable position in bed during surgery	1	3	1.87	.795
Previous surgical/anaesthetic history of patient	1	3	1.49	.635

As shown in Table 4 above, the main factors contributing to intraoperative pain among patients during elective caesarean section under sub-arachnoid block were “long time spent during surgery” (π= 2.05, SD= 0.76) and “ineffectiveness of medications/ injections given to prevent pain” (π= 2.00, SD= 0.67).

DISCUSSION

The study sought to evaluate the frequency and intensity of intraoperative pain experienced by patients undergoing elective caesarean section under sub-arachnoid block. The study also examined factors related to intraoperative discomfort experienced by patients undergoing elective caesarean section under sub-arachnoid block. The study included a sample of fifty-five women who underwent elective caesarean delivery using a sub-arachnoid block. The majority of individuals were young adults between the ages of 31 and 40 (65.5%). This accounts for the fact that the majority (58.2%) of them were married. The vast majority (76.4%) of the women possessed tertiary education, which serves as a clear evidence of the high literacy rate among women. Consequently, the vast majority (96.4%) of them secured employment. This suggests that the ladies may have the ability to cover their own medical costs. The majority of them identified as Christians, comprising 73% of the population. This indicates that the majority of them originated from communities that were predominantly Christian.

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The study's findings on the occurrence of intraoperative pain in women undergoing elective caesarean section with sub-arachnoid block revealed that nearly all (96.4%) of the women encountered some degree of discomfort throughout the procedure. Their physical, emotional, and spiritual wellness is expected to be adversely affected (Zhang et al., 2007). This phenomenon may be associated with the dosage level, as shown by Irabayashi et al. (1995) in their research conducted in Japan. Their study found that higher doses of anaesthetic drugs yielded a greater analgesic effect compared to lesser doses. Hocking and Wildsmith (2004) state that the efficacy of a local anaesthetic is primarily determined by its dosage.

The predominant categories of pain reported by the participants who experienced pain throughout the procedure were acute pain (π= 1.47, SD= 0.99) and persistent pain (π= 1.24, SD= 0.99). This phenomenon could be attributed to the traction effect caused by the surgical technique and the positioning of the ladies during the administration of the sub-arachnoid block.

One of the study's goals was to evaluate the degree of intraoperative discomfort reported following elective caesarean section performed under sub-arachnoid block anaesthesia. The study revealed that a majority of the women (52.7%) had mild pain, while 43.6% experienced significant pain during the surgery. This indicates that although nearly all (96.4%) of the women had some level of discomfort during the treatment, it was neither intense or profound. This also demonstrates the efficacy of the pain-relieving properties of the sub-arachnoid block

. Nevertheless, anaesthetists should increase their efforts as a significant proportion (43.6%) of women encountered moderate pain during the surgery, which may discourage them from seeking the treatment in the future. Another approach is to utilise spinal and epidural anaesthesia in combination, capitalising on the respective attributes of both methods (Norris et al., 2001).

The primary factors that contribute to intraoperative pain in patients undergoing elective caesarean section with a sub-arachnoid block are the extended duration of the procedure (π= 2.05, SD= 0.76). This could be linked to the surgical team's level of expertise, particularly the surgeon, or unforeseen problems. Roofthooft (2009) states that performing surgery can be technically demanding and may exceed the anticipated duration.

Furthermore, the biggest factor that contributed to intraoperative discomfort among patients undergoing elective caesarean section under sub-arachnoid block was the ineffectiveness of drugs or injections used to prevent pain. The mean value for this factor was 2.00 with a standard deviation of 0.67. This highlights the need of anaesthetists controlling the quantities of their anaesthetic agents and verifying that powerful anaesthetic agents are acquired from appropriate sources in order to guarantee the efficacy of their anaesthesia.

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CONCLUSION

This study is a descriptive cross-sectional investigation that aimed to evaluate the level of pain experienced by women after elective caesarean section under sub-arachnoid block, as well as identify the characteristics that are linked to this pain. The study found that a significant number of women (96.4%) experienced intraoperative pain during elective caesarean section performed under sub-arachnoid block. The discomfort primarily consisted of acute and throbbing sensations. Nevertheless, the levels of discomfort experienced during the surgery were classified as mild (52.7%) and severe (43.6%). The primary factors leading to intraoperative pain in patients undergoing elective caesarean section under sub-arachnoid block were the extended duration of surgery and the inadequate efficacy of pain-preventing medicines and injections.

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