



THE RELATIONSHIP BETWEEN LENGTH OF SURGERY AND THE OCCURRENCE OF SHIVERING IN SECTIO CESAREA PATIENTS USING SPINAL ANAESTHESIA

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ABSTRACT

Sectio cesarea is a surgical procedure to deliver a fetus with an incision on the abdominal wall and uterine wall of the mother. Spinal anesthesia in SC can cause shivering. The risk of shivering can occur due to the length of surgery. Objective: To determine the relationship between the length of surgery and the incidence of shivering in SC patients. Methods: This research design uses a correlation with a cross-sectional approach. Sampling technique with Purpose sampling of 115 patients who performed spinal anesthesia on SC patients. The research instrument contains patient data, which includes age, length of surgery, and incidence of shivering. This study used an observation sheet to measure the incidence of shivering in patients undergoing cesarean section, and the results of the data were analyzed using the chi-square test. Results: Most respondents were 21-35 years old (81.7%), the majority of the duration of surgery was less than 60 minutes with 67 patients (58.3%), and the incidence of shivering was 62 patients (53.9%). Conclusion: There is a relationship between the length of surgery and the occurrence of shivering in cesarean section patients who use spinal anesthesia at Efarina Etaham Berastagi Hospital with a p-value of 0.008 (<0.05).

Keywords: length of surgery; post anesthetic shivering (pas); spinal anesthesia

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INTRODUCTION

Sectio cesarea (SC) is a surgical procedure to help the fetus be born by making an incision in the mother's abdominal wall and uterine wall. Anesthetic techniques commonly used for cesarean section deliveries are regional anesthesia and general anesthesia. Most cesarean sections with regional anesthesia are spinal anesthesia. Spinal anesthesia is a local anesthetic technique for performing surgical procedures and operations on the lower abdomen. Spinal anesthesia can reduce emergencies for patients who have disorders such as lungs, diabetes mellitus, and kidneys caused by drug interactions (Sony et al., 2019). The SC procedure will apply regional anesthesia, which involves a subarachnoid block (spinal anesthesia). Spinal anesthesia is helpful in maintaining the depth and speed of isobaric nerves. The advantages obtained are that the effects are mild and can ultimately prevent reactions. Spinal anesthesia is an option for performing SC, which has a low risk. The most common effect after spinal SC is the appearance of shivering. There is a decrease in body temperature due to spinal effects. Shivering after anesthesia is a compensatory mechanism in the body, such as discomfort, the appearance of pain due to stretching of the incision scar, and muscle movement due to oxygen intake from within the body (Manshur, et. al., 2018). Shivering experienced by patients requires the best possible effort or response (Rante et al., 2022).

The duration of a patient's operation in a surgical procedure under spinal anesthesia is usually calculated from the time the initial incision is made until the patient is taken to the recovery room. Surgery is said to be of light duration if the operation lasts ≤ 60 minutes, surgery is said to be of medium duration if the operation lasts 60-120 minutes, and surgery of the most extended duration is if the operation lasts > 60 minutes. The appearance of shivering is often found in patients with operations lasting > 60 minutes. Surgery with spinal anesthesia can expose the body to cold temperatures, resulting in a decrease in body temperature, thus increasing the occurrence of post-anesthetic shivering or the incidence of shivering after anesthesia (Sony et al., 2019). Shivering is the body's compensation mechanism for hypothermia. Shivering must be prevented and treated. Shivering can increase oxygen demand and carbon dioxide production so the body will compensate by increasing pulse rate, blood pressure, and cardiac output. The incidence of shivering after regional anesthesia for SC is 85% (Sumarni et al., 2021). Factors that cause shivering include exposure to cold temperatures in the operating room, surgical duration, physical status, age, and BMI (Mashitoh et al., 2018).

A preliminary study conducted by researchers at Efarina Etaham Berastagi Hospital, Medan, Indonesia in 2022 saw the number of cesarean section patients using spinal anesthesia totaling 1238. Observations in October-November 2022 on 64 patients consisting of 34 patients undergoing cesarean section surgery with spinal anesthesia and 30 patients undergoing Caesarean section operation without spinal anesthesia. Based on the results of observations made, of the 34 patients undergoing SC surgery with spinal anesthesia, 27 had shivering after the operation was completed. Of the 27 patients who experienced shivering, around 14 patients had operations lasting >60 minutes, and 13 patients underwent operations lasting 60-120 minutes. Seven patients did not experience shivering, and the operation process took place quickly in ≤ 60 minutes. The results of observations made on 30 patients undergoing cesarean section operations without spinal anesthesia showed that 12 patients experienced shivering, with 6 patients having operations lasting > 60 minutes and 6 patients having operations lasting 60-120 minutes. Eighteen patients did not experience shivering but experienced complaints of nausea. Patients who did not experience shivering had a quick operation lasting ≤ 60 minutes. This study aimed to determine the relationship between the length of surgery and the occurrence of shivering in cesarean section patients using spinal anesthesia at Efarina Etaham Berastagi Hospital.

METHOD

This research is observational with cross-sectional analysis. This design was used to determine the relationship between the length of surgery and the occurrence of shivering in cesarean section patients using spinal anesthesia at Efarina Etaham Berastagi Hospital. The population in the study of cesarean section patients with spinal anesthesia was 162. Purpose sampling determined the sample using the Solvin formula with the desired level of confidence or accuracy (0.05) or an accuracy level of 95% with a sample size of 115 patients. The research has gone through Ethical Clearance approval with a number B. LPPM-UHB/23117/O9/203.

RESULTS

Table 1.
Age characteristics of cesarean section patients using spinal anesthesia at Efarina Etaham Berastagi Hospital (n=115)

Variable	f	%
Age		
≤ 20 Years	17	14.8
21 - 35 Years	94	81.7
>35 Years	4	3.5
Length of operation		
≤ 60 Minutes	67	58.3
>60 Minutes	48	41.7
Shivering		
Occurred	62	53.9
Not occurred	53	46.1

Table 1, the majority of patients were found to be 21-35 years old, amounting to 94 (81.7%), the duration of the operation was less than 60 minutes, amounting to 67 (58.3%), and the majority of patients were shivering, 62 (53.9%).

Table 2.
The relationship between the length of operation and the occurrence of shivering in cesarean section patients using spinal anesthesia at Efarina Etaham Berastagi Hospital (n=115)

Length of operation	Shivering						p-value
	Yes		No		Amount		
	f	%	f	%	f	%	
≤60 Minutes	29	25.2	38	33.5	67	58.3	0.008
>60 Minutes	33	28.7	15	13.6	48	41.7	
Amount	62	53.9	53	46.1	115	100.0	

Table 2 the p-value is 0.008 (<0.05). There is a relationship between the length of operation and the incidence of shivering in cesarean section patients at Efarina Etaham Berastagi Hospital.

DISCUSSION

Description of the age characteristics of cesarean section patients using spinal anesthesia

The age characteristics of cesarean section patients using spinal anesthesia were found to be the majority aged 21-35 years, 94 (81.7%). Age is the period since a human was born and can be measured using time units. The best age for pregnant women is in the range of 21-35 years. Meanwhile, age less than 20 years or more than 35 years poses a risk to the health of the mother and baby. Age greatly influences the reproductive process, especially 21-35 years old, which is the best age for pregnancy and childbirth (Didien, 2018). Age affects a person's psychology. The older a person gets, the more prepared they are to accept the trials of various problems. The age of pregnant women is classified into three categories, namely: less than 20 years (classified as young), 20-30 years (classified as middle), and more than 30 years (classified as old). Younger people experience stress more efficiently than older people (Wicaksana, 2020). Age can be a cause of shivering because the anatomical, physiological, and thermoregulatory conditions are different in each age group (Romansyah et al., 2022). In line with research by Amir (2020), the results of his research showed that the majority of mothers who underwent cesarean section were 21-35 years old, 71.3% (Amir & Yulianti, 2020).

Description of the length of operation in cesarean section patients with spinal anesthesia

Characteristics of the duration of SC surgery with spinal anesthesia at Efarina Etaham Hospital, Berastagi, the majority of which was less than 60 minutes, 67 (58.3%). The operation time in this study was calculated from the time the first incision was made until the patient was transferred to the recovery room, expressed in minutes. The division of operation time based on duration is divided into 2 groups, namely less than 60 minutes and more than 60 minutes. The long duration of surgery spontaneously causes the anesthesia to take longer, and the effects of drug accumulation in the body appear as the drug use in the body increases. In addition, surgery with a long duration will increase the time the body is exposed to cold temperatures (Didien, 2018). Extended operations can also result in patients experiencing intraoperative hypothermia and Post Anesthetic Shivering (PAS) (Nugroho et al., 2016). Extended operations result in the body being exposed to cold temperatures (Mukarromah et al., 2022). Long surgical duration has the potential for higher drug use to achieve balance in surgical procedures (Masithoh, 2018). Widiyono's research (2020) found that surgical procedures with the spinal majority were fast at 62.3% (Widiyono et al., 2020).

Description of the shivering in spinal SC patients

Shivering in SC patients was found to be 53.9%, and this shows that there are still many SC patients who experience shivering. This event can be observed through the patient's body response, such as contraction of the facial muscles and spreading to the neck and can spread to other parts of the body but will not cause seizures for the patient (Nasman, 2021). The height of the SC block can reach the T4 dermatome, and at the T8 – T10 incision, it blocks the parasympathetic so that it can cause hypothermia and a body response called shivering (Rehatta et al., 2019). In line with Syauqi's research (2019), the results showed that shivering occurred in 27 patients, almost half of whom were 12 patients, 44.4% of whom experienced grade 3 shivering (Syauqi et al., 2019).

The relationship between the length of surgery and the occurrence of shivering in SC and spinal patients

Based on the results of research on the relationship between the length of surgery and the incidence of shivering, it was found that the p-value was 0.008 (less than 0.05), so there was a relationship between the duration of surgery and the incidence of shivering in SC patients at Efarina Etaham Berastagi Hospital. The duration of surgery for patients undergoing surgery with spinal anesthesia is calculated from the initial incision until the patient is transferred to the conscious recovery room. Surgery is said to be of light duration if the operation lasts ≤ 60 minutes, surgery is said to be of medium duration if the operation lasts 60-120 minutes, and surgery of the most extended duration is if the operation lasts > 60 minutes. The incidence of shivering (shivering) is more often found in patients who have undergone surgery for > 60 years. Surgery with prolonged spinal anesthesia increases the body's exposure to cold temperatures, causing changes in body temperature, thus increasing the occurrence of post-anesthetic shivering or the incidence of shivering after anesthesia (Sony et al., 2019).

The length of the surgical procedure carries the risk of shivering appearing after the procedure is carried out (Millizia et al., 2021). The most common period of shivering occurs in the recovery room (Hidayah et al., 2021). The length of the operation can cause the patient's body temperature to become disturbed, and this can result in shivering (Millizia et al., 2021). Long periods of surgical procedures resulting in a loss of body heat for a long duration have the potential for shrinkage (Brunner & Suddarth., 2015). SC patients with a procedure time of more than 60 minutes often experience shivering. Other research shows the emergence of shivering after spinal surgery with a duration of 61-120 minutes (Madjid., 2014). The

appearance of shivering after anesthesia and surgery can be caused by several conditions, such as room temperature, gender, patient age, BMI, and slow or long operating times, which spontaneously make the anesthesia take longer. This condition will take a long time and increase the body's exposure to cold temperatures and cause the impact of accumulation of drugs and anesthetic agents in the body due to the increased time (Mashitoh et al., 2018).

During long surgery times, the patient's body will be exposed to cold temperatures for longer, and this creates a risk of shivering because the patient will need more oxygen to support muscle activity in the body (Irawan, 2018). A patient undergoing a longer surgical time increases shivering by 7.1 times compared to a shorter time for patients undergoing surgery; this is because the patient can maintain body heat during the operation (Mashitoh et al., 2018). There are preventive measures to prevent the emergence of shivering, namely by maintaining body temperature during surgery (Sony et al., 2019). The duration of the operation can affect the incidence of shivering if the procedure takes more than one hour (Rahmawati, 2020). In general, the triggering factors that can support the occurrence of shivering are room temperature and duration of surgery (Rehatta et al., 2019). There is a significant relationship between the duration of surgery and the incidence of shivering, with a correlation coefficient of 0.436 (Mulyandari, 2020).

The impact of shivering can increase metabolism, carbon dioxide, oxygen demand, arterial hypoxemia, lactic acidosis, intracranial pressure, and intraocular pressure. It can cause artifacts on the electrocardiogram monitor known (Syauqi et al., 2019). The incidence of shivering was 41.7%. With an operation time of more than 90 minutes, there were 27 people (56.2%), and the p-value was <0.05 (Mukarromah et al., 2022). Efforts to provide adequate nursing in overcoming the occurrence of shivering in SC surgery patients at Efarina Etaham Berastagi Hospital by making reasonable preparation efforts before surgery and anticipating actions that require a longer time.

CONCLUSION

The majority of patients who undergo SC are 21-35 years old and the length of surgery is usually less than 60 minutes and the majority are shivering.

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