



## COMPARISON OF SHIVERING INCIDENCE BETWEEN POST-SURGERY PATIENTS WITH GENERAL ANESTHESIA AND THOSE WITH REGIONAL ANESTHESIA AT PKU MUHAMMADIYAH GAMPING HOSPITAL

Yosy Budi Setiawan<sup>1</sup>, Intan<sup>2</sup>

Universitas Muhammadiyah Yogyakarta, Indonesia

Email: [dr.yosibudi@gmail.com](mailto:dr.yosibudi@gmail.com)<sup>1</sup>, [intansarah1998@gmail.com](mailto:intansarah1998@gmail.com)<sup>2</sup>

### ABSTRAK

**Kata Kunci:** shivering, general anesthesia, regional anesthesia

Anesthesia is an action performed during surgery for total or regional pain relief. One of the complications that often occur after anesthesia is shivering. The impact of shivering will stretch the surgical wound and cause pain, complications of infection and bleeding. This study aims to compare the incidence of shivering between post-surgery patients with general anesthesia and those with regional anesthesia. Its primary data were collected from PKU Muhammadiyah Gamping Hospital by a consecutive sampling. The study was conducted by dividing 50 respondents into two groups; the post-surgery patients with general anesthesia were 20 respondents and those with regional anesthesia were 30 respondents. After examined with Mann Whitney's SPSS, the incidence of shivering in the patients with general anesthesia was 10%, and those with regional anesthesia was 13.3%. The comparison of the incidence of shivering between both groups obtained a significance value of  $0.725 > 0.05$ , and it could be concluded that there was no difference in the incidence of shivering in the patients with general anesthesia and those with regional anesthesia.

**Corresponden Author: Yosy Budi Setiawan**

Email: [dr.yosibudi@gmail.com](mailto:dr.yosibudi@gmail.com)

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### Introduction

Anesthesia is an action performed during surgery to totally and regionally relieve pain. General anesthesia may contribute to loss of consciousness followed by loss of airway-protective reflexes to produce sedative hypnotic effects, amnesia, relaxation and analgesia (Soto et al., 2010) (Ehrenfeld et al., 2016) (Kovacheva et al., 2022). The general anesthesia can use drugs through intravenous way or inhalation based on certain indications. An ideal anesthetic drug can induce fast and smoothly and cause effects of recovering consciousness immediately after the anesthetic drug is stopped (Röijezon et al., 2015). Meanwhile, regional anesthesia aims

to eliminate the sensation of pain only in a specific part of the body. It includes neuraxial, peripheral and intravenous techniques.

After performing both the general and the regional anesthesia, one of the most common complications that occurs is shivering. The effects of shivering may make the surgical wound stretch and cause pain, making a patient uncomfortable and experiencing complications such as infection and bleeding (Modir et al., 2013) (Iqbal et al., 2017). Both anesthesia can also cause an increase in cardiac outputs, heart rates and arterial pressures. Besides, it can trigger an increase in oxygen consumption, lactic acidosis induction, carbon dioxide production, catecholamine release, and an increase of activities of sympathetic nervous system which can lead to organ dysfunction such as myocardial ischemia (Choi et al., 2017) (Esmat et al., 2021).

A result of study conducted at the Arifin Achmad Hospital in Riau Province found that the incidence of shivering was 16.7% found in 5 of 30 patients (Irawan, 2018) (Nasution et al., 2022). Meanwhile a result of study conducted at Dr. Hasan Sadikin Hospital in Bandung indicated that shivering was 26.45% found in 155 of 586 post-surgery patients with general anesthesia and 26.41% found in 14 of those with regional anesthesia (Tifana et al., 2022) (Muzaki et al., 2022).

The aim of this study was to compare the incidence of shivering in postoperative patients undergoing general anesthesia with those undergoing regional anesthesia. This study aimed to evaluate the extent of the effectiveness of both types of anesthesia in reducing or preventing the incidence of chills in patients after surgery. The benefit of this study is that knowing the difference in the incidence of shivering between patients under general anesthesia and regional anesthesia can help nurses and doctors in providing more precise and personalized patient care.

Based on the discussion above, the researchers examine the incidence of shivering and identify if there is a significant difference between post-surgery patients with general anesthesia and those with regional anesthesia at PKU Muhammadiyah Gamping Hospital.

## **Research Methods**

This is observational analytic research with a cross-sectional approach to identify the incidence of shivering in post-surgery patients with general anesthesia and with regional anesthesia in conscious recovery rooms. Its primary data were post-surgery patients with general anesthesia and those with regional anesthesia for a period of one month who met the inclusion criteria by using a consecutive sampling technique. The data obtained in this study then were analyzed by using an application of Statistical Package for Social Science (SPSS) to examine an unpaired comparative test between the incidence of shivering in post-surgery patients with general anesthesia and those with regional anesthesia. This study was ethically approved by a letter No. 042/EP-FKIK-UMY/VII/2020.

## **Results and Discussion**

The number of respondents in this study was 50 patients, which were divided into two groups. The first group consisted of 20 post-surgery patients with general anesthesia, and the second group consisted of 30 post-surgery patients with regional anesthesia. The distribution of patients in both groups is in the following:

**Table 1. Distribution of Respondents with General Anesthesia Based on Sex and Age**

Characteristics	Frequency	Percentage (%)
Sex		
Male	8	40.0
Female	12	60.0
Total	20	100.0
Age		
17-25	5	25.0
26-35	4	20.0
36-45	3	15.0
46-55	5	25.0
56-65	3	15.0
Total	20	100.0

Based on table 1 concerning patients with general anesthesia, there were 8 male respondents (40%) and 12 female respondents (60%). Then based on age, there were 5 respondents (25%) with 17-25 years old, 4 respondents (20%) with 26-35 years old, 3 respondents (15%) with 36-45 years old, 5 respondents (25%) with 46- 55 years old, and 3 respondents (15%) with 55-65 years old.

**Table 2. Distribution of Respondents with Regional Anesthesia Based on Sex and Age**

Characteristics	Frequency	Percentage (%)
Sex		
Male	19	63.3
Female	11	36.7
Total	30	100.0
Age		
17-25	6	20.0
26-35	7	23.3
36-45	7	23.3
46-55	5	16.7
56-65	5	16.7
Total	30	100.0

Based on table 2 concerning the patients with regional anesthesia, there were 19 male respondents (63%) and 11 female respondents (36%). Based on their age, there were 6 respondents (20%) with 17-25 years old, 7 respondents (23.3%) with 26-35 years old, 7 respondents (23.3%) with 36-45 years old, 5 respondents (16.7%) with 46-55 years old, and 5 respondents (16.7%) with 55-65 years old.

**Table 3. Percentage of the Shivering**

Characteristics	Frequency	Percentage (%)
General Anesthesia		
No	18	90.0
Yes	2	10.0
Total	20	100.0
Regional Anesthesia		
No	26	86.7

Characteristics	Frequency	Percentage (%)
Yes	4	13.3
Total	30	100.0

Basen on table 3, the shivering occurred in 2 patients (10%) of the 20 patients with general anesthesia and in 4 patients (13.3 %) of 30 patients with regional anesthesia.

**Table 4. Values of the Shivering**

	Frequency
Mann-Whitney U	290.000
Wilcoxon W	500.000
Z	-.352
Asym. Sig. (2-tailed)	.725

Based on table 4, the Asymp sig of the shivering incidence was 0.725.

## Discussion

Based on the results of this study, 2 respondents (10%) of 20 post-surgery patients with general anesthesia experienced shivering. In a study conducted by Tamara Tantoro *et al.* (2015) at COT RSHS, the incidence of shivering in post-surgery patients with general anesthesia was (26.45%). Restiana (2012) found that 16.6% post-surgery patients with general anesthesia were shivering at dr. Kariadi Semarang. From these previous studies' results, it could be seen that the incidence of shivering in the post-surgery patients with general anesthesia at PKU Muhammadiyah Gamping Hospital was less than that in previous studies.

Meanwhile, 4 post-surgery respondents (13.3 %) of 30 patients with regional anesthesia experienced shivering. In a study conducted by Dino Irawan at Arifin Achmad Hospital Pekanbaru (2018), the incidence of shivering was 16.7%. Nur Akbar Fauzi *et al.* (2014) found 29% of shivering at Karawang Hospital (Irawan, 2018). A study conducted by Tamara Tantarto *et al.* (2015) also pointed out 26.41 % incidence of shivering in post-surgery patients with regional anesthesia. From these results, it implied that the incidence of shivering in Muhammadiyah Gamping Hospital was smaller than previous studies. Likewise, 36-60% of shivering after surgery was reported in studies by Kelsaka *et al.* (2006), Sagir *et al.* (2007), and Roy *et al.* (2004).

Because the respondents involved were  $\leq 50$  patients, the Shapiro Wilk test was applied to test the normality of the data in this study, and a significance value of 0.000 was obtained. In this test the data were considered to be normally distributed if the significance value was  $> 0.05$ , so this implied that the data were not normally distributed. Because the data were not normally distributed, a non-parametric test, the Mann Whitney test was implemented to perform a comparison test. In this study, a significance value of 0.725 was obtained; in a comparison test was a difference if the significance value was  $< 0.05$ . This indicated that there was no difference in the incidence of shivering between the patients with general anesthesia and those with regional anesthesia.

Based on a theory, the incidence of shivering may be influenced by several factors, including: duration of surgery, age, type of anesthesia, gender and so on. In this study, the duration of surgery ranged from 45-60 minutes, which was calculated from the start of the

incision to the transfer to the recovery room; therefore, this was included in the category of mild and moderate surgery. In a reference it was reported that shivering incidence might often occur in patients undergoing surgery for 61-120 minutes (MADJID, 2014) (Millizia et al., 2020) (Hidayah et al., 2021). Shivering is a response to hypothermia during surgery between blood and skin temperature and main body temperature; surgery with long spinal anesthesia may increase the body's exposure to cold temperatures, causing changes in the body temperering can be treated in some ways, including minimizing heat loss during surgery with various interventions such as warming intravenous fluids, increasing the ambient temperature, wearing blankets and using drugs (Nugroho et al., 2016) (Nasrun et al., 2022).

### **Conclusion**

Based on the results of this study, it could be concluded that there was no significant difference in the incidence of shivering between post-surgery patients with general anesthesia and those with regional anesthesia. Furthermore, future researchers are suggested to study factors that may significantly influence shivering incidence in post-surgery patients with general or regional anesthesia by using a multivariate data analysis to obtain wider knowledge, especially in the field of anesthesia.

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