

## THE INFLUENCE OF PASSIVE RANGE OF MOTION (ROM) ON LOWER EXTREMITY IN POSTOPERATIVE PATIENTS WITH SPINAL ANESTHESIA IN RUMKITBAN SIDOARJO

Meli Diana<sup>1\*</sup>, Ainul Yachin<sup>2</sup>

<sup>1</sup> Kerta Cendekia Nursing Academy, Sidoarjo, East Java Province, Indonesia

<sup>2</sup> Rumkitban Sidoarjo, East Java Province, Indonesia

**\*Correspondence:**

Meli Diana

Email: melidiana159357@gmail.com

### ABSTRACT

**Background:** Patients to be operated will receive anesthesia, one of which is spinal anesthesia. Patients who receive spinal anesthesia are usually transferred to the recovery room to stabilize the condition. Some actions that can increase venous return and normal blood circulation flow, one of which is the action of range of motion exercises (ROM).

**Purpose:** The purpose of this study was to identify the effect of passive range of motion exercises (ROM) on the motor response of the lower extremity in postoperative patients with spinal anesthesia in Rumkitban Sidoarjo.

**Methods:** This study used a Quassy experimental design with a one group pretest-posttest approach. The number of samples were 25 people and collected using incidental sampling techniques. The data obtained were then analyzed using the Wilcoxon test with  $p \leq 0.01$ .

**Results:** As many as 80% of postoperative patients with spinal anesthesia who are given passive range of motion exercises (ROM) can achieve Bromage score 2 in the first 2 hours after surgery. Wilcoxon test results indicate that the p value (0,000). The conclusion of this study is that passive range of motion exercises (ROM) can improve the lower limb motoric response in postoperative patients with spinal anesthesia.

**Discussion:** The main task of nurses in the recovery room is to observe blood pressure, respiratory status, oxygen saturation, and level of consciousness. In addition, nurses must apply passive range of motion exercises to postoperative patients to accelerate the patient's recovery from the effects of anesthesia.

**Key words:** Passive Range of Motion, lower limb motoric response.

### INTRODUCTION

Range of motion (ROM) is a number of movements that can be carried out by the joints in one of three body parts. Patients who experience limited mobilization are not able to do some or all ranges of movement independently. Patients who have limited range of motion can be given nursing intervention in the form of range of motion exercises. This exercise is used to maintain or increase muscle strength, joint

mobilization, and prevent joint contractures. Range of motion exercises can be either active or passive. In the active range of motion, the patient moves all his joints independently, while in the range of passive motion, the patient moves all his joints with the help of nurses partially or totally. Patients who undergo surgery will receive anesthesia, one of which is regional anesthesia. Regional anesthesia causes loss of sensation in certain areas of the body.

The induction method affects the part of the sensory pathway that is given anesthesia. In spinal anesthesia, anesthesia will spread from the tip of the xyphoideus processus to the legs. The postoperative action is carried out in two stages namely the recovery stage and the healing stage. For patients undergoing surgery a day, recovery normally occurs within one to two hours postoperatively (Perry & Potter, 2006).

After surgery, patient care can be complex due to physiological changes that may occur. Patients who receive spinal anesthesia are usually transferred to the recovery room to stabilize the condition. The patient remains in the recovery room until fully recovering from the effects of anesthesia namely stable blood pressure, normal respiratory status, minimum oxygen saturation of at least 95%, and good awareness. Initial actions aimed at preventing complications of circulation can prevent static circulation. Some actions that can increase venous return and normal blood circulation flow include: encouraging the patient to do foot exercises at least every hour while the patient is awake, avoiding positions that can interfere with blood flow to the lower extremities, and encourage the patient to ambulate earlier. Patients with spinal anesthesia will feel the return of motor function ahead of tactile sensations. In the assessment of the patient's ability to move the lower extremity using the Bromage scale. Patients can be moved to the treatment room if it has reached score 2 which is able to reflect on the ankle but has unable to flex knees (Prasetija, 2011). The ability to apply ankles normally occurs after 1-2 hours postoperatively. Based on observations of 5 patients who were in the recovery room at Rumkitban Sidoarjo, for 2 hours postoperatively the patient unable to move legs or feet, it means that Bromage score was still at number 3. The Bromage

score in the patient decreased stating that the motor function had returned to normal.

To increase the speed of postoperative recovery time in the recovery room, that must be taken by nurses include: monitoring vital signs every 15 minutes, providing passive range of motion exercises starting immediately after exiting the operating room, and providing health education to patients about the benefits of doing active and passive range of motion exercises until the patient can mobilize independently.

## **METHODS**

### *Study Design*

This research using Quassy experimental design with one group pretest and posttest approaches.

### *Setting*

This research was conducted on 2 to 14 April 2018 in the recovery room at Rumkitban Sidoarjo.

### *Research Subject*

The number of samples in this study were 25 respondents. Respondents were collected using incidental sampling techniques.

### *Instruments*

Researchers conducted a pretest by measuring the Bromage score in the lower extremity of respondents who had lead surgery with spinal anesthesia and were in the recovery room. After a pretest, the patient is given passive range of motion exercises. After 2 hours postoperatively, the respondent's motor lower extremity was measured by using the Bromage score again to assess the increased motor ability of the lower extremity. The motoric response of lower extremity of the patient is increase if it has reached a Bromage score of 2.

### Data Analysis

The researcher conducted data analysis using the Wilcoxon test with  $p \leq 0.01$ .

### Ethical Consideration

Ethical clearance was obtained from the director of Rumkitban Sidoarjo to get the permission. Data collection procedure started with the informed consent to participants that they were briefed about the study and kept their confidentiality.

## RESULTS

General research data including age, education level, and operating experience that shown in the table below:

### Characteristics of Respondents

**Table 1.** Distribution of Frequency of Respondents at Rumkitban Sidoarjo in April 2018 (n = 25).

Characteristics of Respondents	Frequency (f)	Percentage (%)
<b>Age (Years)</b>		
20 – 25	9	36
26 – 30	6	24
32 – 35	10	40
<b>Total</b>	<b>25</b>	<b>100</b>
<b>Educational Level</b>		
Junior High School	1	4
Senior High School	11	44
University	13	52
<b>Total</b>	<b>25</b>	<b>100</b>
<b>Operating Experience</b>		
Ever	12	48
Never	13	52
<b>Total</b>	<b>25</b>	<b>100</b>

*Examination of the Effect of Passive Range of Motion Exercises (ROM) on the Motor Response of the Lower Extremity in Postoperative Patients with Spinal Anesthesia in Rumkitban Sidoarjo using Wilcoxon test.*

**Table 2.** Examination of the Effect of Passive Range of Motion Exercises (ROM) on the Motor Response of the Lower Extremity in Postoperative Patients with Spinal Anesthesia in Rumkitban Sidoarjo in April, 2018 (n = 25).

Treatment	Bromage Score				Wilcoxon Test $p < 0.01$
	Score 3	%	Score 2	%	
Patient with passive ROM exercise	5	20	20	80	$z = -4.472$ $p = 0.000$

## DISCUSSION

Based on the results of the study above showed that 80% postoperative patient with spinal anesthesia who were given passive range of motion exercises postoperative with spinal anesthesia were able to achieve Bromage score 2 within  $\leq 2$  hours. After being tested using the Wilcoxon test showed that the p value (0.000) so that it can be concluded that passive range of motion exercises can improve the lower extremity motoric response in postoperative patients with spinal anesthesia. Research conducted by Nuryadi (2011) shows that post sectio cesarean patients with spinal anesthesia with a dose of Bupivacain 0.5% 20 mg require time to achieve Bromage score 2 in the minutes 190-235, whereas in a 0.5% 15 mg bupivacain achieved in minutes 155-195.

Both studies conclude that the average time needed to achieve Bromage score of 2 in postoperative patients with spinal anesthesia is 190-235 depending on the dose of the drug. However, by providing

passive range of motion exercises as soon as the patient is in the recovery room can accelerate the achievement of Bromage score 2 within  $\leq 2$  hours.

This study is in accordance with Ananda's research (2016) which shows that range of motion exercises (ROM) can increase muscle strength in elderly bedrest in PSTW Budhi Mulia 3 Marga for South Jakarta with a p value (0.000). A similar study was carried out by Bakara and Warsito (2016) which showed that there were significant differences between the mean upper and lower limb joints in post-stroke patients before and after passive ROM exercises with z values of -2.236 and p values  $<0.05$ .

Early mobilization must be done immediately after surgery. Early mobilization must be conducted within the first 24 hours and carried out under supervision to ensure that the exercise is appropriate and carried out in a safe manner. In the first 24 hours postoperatively with spinal anesthesia the patient is only allowed to do early mobilization in bed. At 2 hours postoperatively, the patient is still under the influence of anesthesia and the effect of anesthesia to be lost if all three functions of motor, sensory, and autonomy have returned. At the time of 2 hours after surgery, early mobilization can only be done with the help of nurses or also called passive range of motion exercises (ROM). Passive range of motion exercises are performed to improve blood circulation, prevent joint contractures, and accelerate the return of physiological functions to the patient's body (Brunner & Suddarth, 2015). The impact of the long recovery period can include psychological disruption due to limited movement in the lower extremities, paresthesia's, and motor weakness.

## CONCLUSION

The conclusion of this study is that passive range of motion exercises (ROM) can increase the motoric response of the lower extremity in postoperative patients with spinal anesthesia in the recovery room at Rumkitban Sidoarjo with p value (0.000).

## SUGGESTION

The results of this study are expected to be used as input for adding passive range of motion exercises in the Standard Operating Procedure (SOP) in the recovery room to speed up the recovery period of the patient and speed up the patient to be sent to the inpatient room. This research is also expected to increase nursing care and improve the quality of nursing care.

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