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The Effectiveness of Foot Massage Therapy as Additional Complementary Therapy in Post-SC Patients in the ICU Room: A Case Report

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ABSTRACT

Patients with pregnancy complications, especially placenta increta, which results in antepartum hemorrhage, will experience hemodynamic instability. Patients who are at risk of long-term hypovolemia are at risk of hemodynamic instability. Hemodynamic instability, or unstable blood flow, is common in critically ill patients requiring intensive care. One additional non-pharmacological therapy that can support the hemodynamic status of ICU patients is foot massage. The purpose of this study was to test the effectiveness of the Foot Massage Therapy intervention in post-CS patients in the ICU. The research method used was a case study, with a 4-day research period. Data collection began with medical records, assessments, and observations. Based on the evaluation results before and after the foot massage procedure, significant improvements in MAP, blood pressure, RR, and pulse rate were observed, with SPO2 values remaining unchanged. Foot massage therapy is effective for patients with APB in the intensive care unit, with significant changes in hemodynamic status. Therefore, this foot massage technique can be applied in all hospital rooms and is quite effective as a complementary therapy to stabilize patient hemodynamics, especially in the ICU.

Keywords: Foot Massage Therapy, Complementary Therapy, Surgery, Sectio Caesarea

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1. INTRODUCTION

Cesarean section (C-section) is used to treat antepartum hemorrhage or postpartum hemorrhage in pregnant women. Antepartum hemorrhage occurs from 20 weeks of gestation until delivery. Antepartum hemorrhage can cause high maternal and neonatal mortality rates (Mardiansyah et al., 2023). Antepartum hemorrhage in pregnant women in the third trimester and after the placenta is delivered is severe bleeding. If left

untreated, it can lead to shock. 19.1% of hospital deaths after childbirth are caused by postpartum hemorrhage. Each year, approximately 140,000 women die from postpartum hemorrhage, with one death every four minutes (Putri, 2020). According to the Indonesian Health Ministry (IDHS), the maternal mortality rate (MMR) for the period 2003-2007 was 228 per 100,000 live births. The maternal mortality rate (MMR) in 2009 was 390 per 100,000 live births, compared with 237 per 100,000 live births in 2006, out of a total of 4. In 2005, there were approximately 726 cases of placenta previa, and 40 mothers died. The following year, in 2006, there were 4,409 cases of placenta previa, and 36 mothers died. Given the high maternal mortality rate worldwide, including in Indonesia, education about antepartum hemorrhage is necessary to prevent the death of pregnant women or mothers giving birth (Batra & Sirait, 2021). Antepartum hemorrhage occurs due to trauma or placenta previa, including placenta increta (Julieta & Widiastuti Giri, 2021). Uncontrolled bleeding during major surgery and trauma can lead to patient death. In obstetrics, massive transfusion is used to treat severe postpartum hemorrhage. Postpartum hemorrhage is the loss of more than 500 mL of blood during or after delivery. Postpartum blood loss causes unstable blood flow. Severe postpartum hemorrhage is blood loss of more than 1,000 mL. Massive obstetric hemorrhage is the loss of 50% of circulating blood volume in less than 3 hours, or blood loss of more than 150 mL/minute (Uyun, Pratomo, & Hernawan, 2020). Hemodynamic instability is common in critically ill patients requiring intensive care. If not treated promptly, the patient's condition can worsen and even lead to death. Unstable hemodynamics can increase the risk of death in patients with cardiovascular problems. Organ failure can occur due to delayed or poor therapy (Utami & Barbara, 2023). Unstable hemodynamics with increased MAP, heart rate, and respiratory rate, and decreased oxygen saturation are caused by increased vasomotor activity in the medulla, leading to arteriolar vasoconstriction and increased peripheral resistance (Jevon & Ewens, 2009). ICU Patients and Post-Cesarean Section Patients with a History of Complicated Diseases are at Risk of Hemodynamic Disorders (Upoyo & Taufik, 2018).

Intensive patient monitoring is necessary to determine factors that contribute to the need for ICU care, not due to the C-section procedure, but due to increased vasomotor activity. Foot massage therapy can help improve a patient's

hemodynamic status. Foot massage therapy is a non-pharmacological technique for stabilizing a patient's hemodynamic status in the intensive care unit. This therapy involves massaging, rubbing, and massaging connective tissue to improve circulation, repair muscles, and provide a relaxing effect (Kurniawan, Kristinawati, & Widayati, 2019). Foot massage can help restore homeostasis by regulating blood flow, relaxing muscles, and dilating blood vessels. Foot massage also affects heart rate, increases comfort, and balances blood pressure and pulse (Ainun, Kristina, & Leini, 2021). Therefore, research is needed to implement Foot Massage Therapy as an Additional Complementary Therapy for Post-Cesarean Section Patients in the ICU.

2. CASE PRESENTATION

A patient with decreased consciousness was admitted to the Intensive Care Unit (ICU) requiring continuous hemodynamic monitoring. The patient was unable to provide written informed consent initially due to altered consciousness; however, verbal assent was obtained through head nodding. Written informed consent was obtained subsequently when the patient's condition improved sufficiently to allow writing.

Upon admission, the patient presented with elevated hemodynamic parameters. The patient received foot massage therapy as a nursing intervention based on Evidence-Based Nursing (EBN) guidelines over a 4-day period from February 27 to March 2, 2023. The therapy was administered for 20-30 minutes per session following a standardized protocol consisting of five massage techniques: effleurage, petrissage, tapotement, friction, and vibration. Vital sign measurements were taken before and after each intervention session.

Indicator	Result							
	1st day		2nd day		3rd day		4th day	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
BP (mmHg)	167/82	162/74	160/69	149/69	142/71	128/60	148/63	124/64
MAP (mmHg)	109	98	102	101	97	84	90	85
RR (per minutes)	21	21	23	21	23	18	13	21
HR (per minutes)	99	86	71	70	79	70	76	82
SpO_2	99%	99%	99%	99%	99%	99%	99%	99%

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While the client remained in a state of decreased consciousness in the ICU, the researcher conducted an objective assessment and monitored the client's hemodynamic status. Informed consent was initially obtained via a head nod, with the formal signature provided later once the client's condition improved enough to write. In accordance with the Evidence-Based Nursing (EBN) journal guidelines and a standard SOP, foot massage therapy was administered. On the first day of action, February 27, 2023, at 18:22 WIB, pre-intervention vitals were recorded as blood pressure 167/82, MAP 109, RR 21, HR 99, and SPO2 99%; post-intervention data showed a reduction to blood pressure 162/74, MAP 98, RR 21, HR 86, and SPO2 99%. On the second day, February 28 at 20:30 WIB, pre-intervention data indicated a blood pressure of 160/69, MAP 102, RR 23, HR 71, and SPO2 99%, which shifted post-intervention to a blood pressure of 149/69, MAP 101, RR 21, HR 70, and SPO2 99%. By the third day, March 1 at 20:33 WIB, pre-intervention vitals were blood pressure 142/71, MAP 97, RR 23, HR 79, and SPO2 99%; post-intervention results showed further stabilization with blood pressure 128/60, MAP 84, RR 18, HR 70, and SPO2 99%. However, on the fourth day, March 2 at 18:22 WIB, the pre-intervention data returned to blood pressure 167/82, MAP 109, RR 21, HR 99, and SPO2 99%, and the post-intervention data remained unchanged at these same levels.

3. DISCUSSION

The application of the results of this foot-massage study aims to stabilize hemodynamics during ICU treatment. A problem analysis was conducted to determine the effectiveness of providing foot massage in stabilizing hemodynamics. A foot massage intervention is performed on critical patients in the ICU, selected according to predetermined criteria. The foot massage lasts 20-30 minutes, followed by an evaluation. The measurement tool is an observation sheet to assess hemodynamic changes on the patient's bedside monitor (Kurniawan et al., 2019). A foot massage applied to patients with hemodynamic instability can increase circulation, induce arterial vasodilation, reduce muscle tension, and promote smooth muscle relaxation. The journal foot massage application performed on critical patients with hemodynamic instability in the ICU benefits by stabilizing hemodynamics (HR, RR, and MAP), thereby reducing ICU patient days.

The therapy was initiated with hand hygiene and patient identification to maintain patient safety. Hemodynamic

measurements were obtained before and after the intervention. During the first implementation, an allergy test was performed by rubbing a small amount of oil onto the respondent's hand. The patient has no signs of allergy; therapy can be initiated. This therapy is carried out by massaging the feet with 5 techniques, including the effleurage technique, which is a light rubbing motion with both palms for ± 3 minutes. The second technique is petrissage, a massaging or squeezing movement with the palms or fingers for ± 3 minutes. The third technique is friction, which is a small circular motion with deeper emphasis using the finger or thumb for ± 3 minutes. The fourth technique is vibration, which is achieved by vibrating your palms or fingers for ± 3 minutes. The fifth technique is tapotement, which involves giving blows to both hands alternately for ± 3 minutes. After the client finishes the foot massage, the patient rests for 5-10 minutes. Then advise the client to drink water, and then perform hemodynamic measurements after the intervention. Then perform hand hygiene, and continue to evaluate the patient's response after the intervention.

In general, patients in the ICU receive medical therapy, one of which can be a barrier, such as sedation. Medication therapy that contains sedatives used by patients includes Milos and N-epinephrine. Research by Gong et al. (2020) found that dexmedetomidine treatment was more effective than midazolam in reducing the frequency of real agitation. MAP and HR, but not SpO2, were significantly lower than in the midazolam group. S-100β and NSE plasma protein levels showed a significant decrease in the dexmedetomidine group compared with the midazolam group.

Meanwhile, research from Millizia (2018, namely the provision of inadequate sedation during treatment in the intensive care unit (ICU), can cause anxiety, long duration of use of mechanical ventilation, and prolong the length of hospitalization. However, in this scientific paper, when the intervention therapy was given, the patient was no longer sedated due to an increase in MAP and blood pressure, so the therapy was stopped. The patient was conscious but remained on a ventilator, suggesting confounding factors during the intervention. This can happen because foot massage stimulates parasympathetic nerve fibers, which release acetylcholine to activate nodal cells, thereby reducing the frequency of depolarization and decreasing heart rate. Furthermore, a decrease in heart rate can prolong ventricular filling time, thereby increasing stroke volume and cardiac output. Good cardiac output can

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increase blood circulation throughout the body, including the lungs, so that the exchange of oxygen and carbon dioxide becomes balanced. With a balanced concentration of oxygen and carbon dioxide in the tissues, oxygen saturation will increase, and the stimulation of the respiratory center will reduce respiratory frequency towards normal. On the fourth day of treatment, the patient had greatly improved, so he was transferred to the Dahlia/postpartum room. Students say thank you for being cooperative while being patient under management.

This intervention is also in line with research by Ainun et al. (2021), namely, that massage therapy circulates blood to the joints, increases oxygen delivery, relaxes muscle tension, facilitates blood flow to the heart, and stabilizes blood pressure. Research by Saputra & Purnomo (2021) found that foot massage affects the sympathetic nervous system, causing relaxation in the body, decreasing epinephrine and serum cortisol, decreasing sympathetic nerve activity, and causing vasodilation of peripheral blood vessels, resulting in a decrease in heart rate. In addition to affecting MAP and HR, foot massage significantly affects breathing (RR). Based on the data above, it can be concluded that foot massage therapy is effective for patients with APB in the intensive care unit, with significant improvements in hemodynamic status, so that this foot-massage technique can be applied in all hospital rooms and is quite effective as a complementary therapy to stabilize the patient's hemodynamics, especially in the ICU.

4. CONCLUSION

The researchers implemented the exercises once a day, with foot massage using five movements for 20-30 minutes. The success of the implementation can be seen in the observation sheet, which shows significant increases in blood pressure, MAP, pulse, and RR. With that, foot massage therapy is an additional exercise therapy that can help stabilize hemodynamic status, especially in patients experiencing Post-SC with APB in the ICU. Foot massage therapy is effective for patients with APB in the intensive care unit, with significant changes in hemodynamic status. So that this foot massage technique can be applied in all rooms in the hospital and is quite effective as a companion therapy to stabilize the patient's hemodynamics, especially in the ICU

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AUTHOR CONTRIBUTIONS

ISA and RAY was responsible for conceptualization, methodology, formal analysis, original draft writing, supervision, and project administration. ISA was contributed to data curation, article screening, data extraction. ISA, RAY, RR, and HR manuscript review and editing, and visualization.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy or ethical restrictions.

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