

Lumbar Cold Compresses Reduce Pain After Surgery

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Abstract— Postoperative pain is an unpleasant experience. Most patients undergoing surgery will experience pain. Pain sensations are varied. The actions of nurses independently have an important role in reducing postoperative pain. This study aims to see the effect of cold compresses on the lumbar area in reducing postoperative pain. Method: The quasi-experimental design without control group was used in this study. The study sample was 14 people. All patient with spinal anesthesia held to be sample. The cold compress is applied to the lumbar area for 10 minutes with a temperature of \pm 10-18 degrees Celsius 8 hours postoperatively. Paired t test is used to analyze data in this study. Result: The average pain before cold compress is 5.7. The average pain after compress is 4.7. Paired t test results obtained p value $<$ 0.05. Cold compresses on the lumbar area can reduce pain. Discussion: Compression of the lumbar can reduce postoperative pain. This can be an alternative choice of independent measures of nursing

Keywords: Pain, Cold Compress, Surgery

1. INTRODUCTION

Postoperative pain is caused by the presence of a mechanical stimulus due to tissue damage from a surgical procedure that is a wound (incision), so it will stimulate chemical mediators from pain (Potter & Perry, 2009). These chemicals include prostaglandin, histamine, serotonin, bradykinin, acetyl choline, P substance, leukotriene. These substances will be induced by nociceptors and transmitted by A-delta and C fibers to neuroaxis where these substances can increase pain sensitivity (Smeltzer & Bare, 2010). Post surgery makes the skin open and injured so that it stimulates the pain impulses to the sensory nerves (A-delta fibers and C fibers) are activated transmitted to the posterior horn in the spinal cord. Afferent nerves will convey the perception of pain to the brain.

Cold compresses can reduce prostaglandin by inhibiting the inflammatory process. Cold compresses can increase endorphin release which blocks pain transmission and stimulates A-beta nerve fibers, thereby reducing the transmission of pain impulses through A-delta fibers and C nerve fibers (Tamsuri, 2007). Cold compresses reduce prostaglandins that strengthen pain receptors, inhibit the inflammatory process and stimulate endorphin release. Cold compresses reduce the transmission of pain through small-diameter A-delta and C fibers and activate faster and greater transmission of A-beta nerve fibers (Andarmoyo, 2013). Based on the research of Breslin, et al (2015), giving cold compresses for 10-20 minutes can increase pain thresholds, reduce blood flow, reduce edema, cell metabolism, and transmission of pain to nerve tissue will decrease. Cold compresses are usually applied to reduce edema, after surgery the first 24 hours as analgesic (anti-pain). Gate control theory, cold compress is an electrophysiological action delivered quickly by small and non-myelin myelin fibers of C fibers inhibited thereby reducing the increase in the number of nociceptive stimuli (Indriyani, 2013).

Cold compresses stimulate thermoreceptors in the skin and deeper tissue which have the effect of inhibiting (closing) pain in the spinal cord to modulate pain transmission so that pain perception decreases (Tracy & Lane, 2009).

The effect of cold compresses on the back of the neck or the nape of the neck aims to inhibit the sensation of pain that will be delivered by nerve impulses to the central nervous system (brain). William & Ramakhrisnan (2014) stated that cold compresses in the back of the neck in patients with headache can

cause diminution of blood vessels, inhibit blood flow, kill sensation of pain, slow down the inflammatory process. Temperature is recommended for cold compresses of ice between 180 - 270 C for approximately 15-20 minutes for peripheral nerve injury (Kozier & Erb, 2010). Tracy & Lane (2009) recommends the temperature of cold compresses given is 10-200 C. Wienarti & Muharyani (2016) examined the effect of ice pack therapy on changes in pain scale in post episiotomy mothers. The results showed that there was a difference in the scale of pain before and after ice pack therapy in the perineum with a temperature of 150 C with a p-value of 0.001. Skin stimulation with cold compresses causes endorphin release, so it can block transmission of sensory pain. Oliviera et al (2012) examined cold therapy in the perineum at three different times (10, 15, and 20 minutes) to reduce the pain of normal post partum patients using a temperature of 10 - 150 C with p-value 0.01.

Many studies have been carried out on cold compresses but in post hemorrhoidectomy patients in the neck (back neck) it has never been done. Cold compresses can be applied near the location of the pain, on the side of the body that is opposite but related to the location of pain, or the location that lies between the brain and the location of pain (Kozier & Erb, 2010). The cervical nerves are formed by the cervicobrachial plexus and nerves to the head which play a role in the functioning of the upper extremities and are involved in the production of pain (Tulaar, 2008). The neck (back neck) is an area that is rich in blood vessels and nerves. The neck is also a location close to the brain area. The presence of a tampon causes a feeling of blocking in the anus post hemoroidectomy (Langenbach, et al 2013). Daily Nutrition News (2016) states that placing ice cubes in a curve at Feng Fu's point for 10 - 20 minutes will provide an extraordinary sensation. At first 30-40 seconds feeling cold, then it will give a sense of warmth. This is because cold stimulates endorphins released by the brain and flows into the blood vessels, making euphoria and relaxing the body. Based on this background this study aims to determine the reduction in postoperative pain after being given a cold compress on the lumbar portion.

2. MATERIALS AND METHOD

The design of this study is Quasi experiment without a control group with a simple random sampling technique. A total of 14 respondents were included in this study. This research was conducted in April to May 2018 in the surgical room of the Sultan Agung Islamic Hospital of Semarang. The inclusion criteria of this study are all postoperative patients with regional type of anesthesia, able to communicate verbally and non-verbally. This study was approved by the health research ethics committee before data collection was carried out. Retrieving data 8 hours after regional anesthesia, before cold compresses with temperatures of ± 10-180 Celsius for 10 minutes in the lumbar (L) 2 to L4 area, researchers took pain scale data using a numeric rating scale (NRS). Taking post-action data is done shortly after the cold compress is done. The parametric test used is the paired t test analysis test.

3. RESULTS AND DISCUSSION

Based on table 1, in this study the sex of male respondents and women had the same percentage, with 78.6% of respondents having had the first operation.

Tabel 1. Description of respondents by sex and history of surgery

Variable	Frequency (respondents)	Percentage (%)
Sex		
Men	7	50
Woman	7	50
History of surgery		
One time	11	78,6
More than one time	3	21,4
Total	14	100

Tabel 2. Description of age, pain before and after intervention in respondents

Variable	Mean±SD	Median	Min-max	95% CI	n	P value
Age	54.7±10.6	52.5	37-76	48.5-60.8	14	
Pain before intervention	5.71±1.54	6	3-8	4.82-6.60	14	0.0001
Pain after intervention	4.57±1.78	4.5	2-8	3.54-5.60	14	

Based on table 2, it can be seen from the age characteristics of the youngest respondents that they are 37 years old while the oldest are 76 years old. The pain level before the intervention was median 6 then after the intervention decreased to a median of 4.5 and statistically there was a significant difference in the decline. Cold compress is a method that uses fluids or tools that can cause a cold sensation in the parts of the body that need it, (Asmadi, 2008). The purpose of cold compresses is to reduce pain in a local area. Cold compresses work by stimulating the surface of the skin to control pain Cold therapy given will affect the impulses carried by tactile A-Beta fibers to dominate so that the "gate" will close and the pain impulses will be blocked. Pain that is felt to be reduced or lost for a while (Prasetyo, 2010).

This research is in line with the research conducted by Rahmawati in 2011 on 20 respondents with moderate pain 12 (60%), who often influenced the changes in pain scale levels from moderate pain (scale 4–6) to mild pain (scales 1-3). Damaged tissue around a broken bone in a fracture can cause pain including moderate to severe pain and gain weight when moved. Pain is a sensation of individual discomfort. Pain management includes pharmacological and non-pharmacological interventions. Pharmacologically involves the use of drugs while non-pharmacology includes cutaneous stimulation in the form of cold compresses.

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This research is in line with research conducted by Rahmawati in 2011 on 20 respondents with moderate pain 12 (60%), mild pain 4 (20%), and severe pain 4 (20%) before giving cold compresses. After administration of cold compresses, mild pain of 15 (75%), moderate pain 4 (20%), and severe pain 1 (5%) were found in the field of nursing, cold compresses were used to reduce pain. In cold applications it has a physiological effect which decreases the inflammatory response, decreases blood flow and reduces edema, reduces local pain (Tamsuri, 2007).

This technique is related to the gate control theory where skin stimulation in the form of cold compresses can activate the transmission of larger and faster A-Beta sensory nerve fibers. This closes the "gate" thus decreasing pain transmission through C fibers with small diameters (Melzack & Wall, 1965, in Potter & Perry, 2010). Cold compresses will have an analgesic effect by slowing down the speed of nerve impingement so that pain impulses reach the brain less. Other mechanisms that might work that cold perception become dominant and reduce pain perception (Price & Wilson, 2006).

4. CONCLUSION

Cold compresses can be used as an alternative to relieve postoperative pain because it can reduce pain levels and can also reduce the inflammatory response

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