Application of Warm Compress Therapy to Reduce Pain in Cholelithasis Patients with Acute Kidney Injury and Liver Insufficiency: A Case Study

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Abstract

Cholelithiasis occurs due to the formation of stones in the gallbladder that block the flow of bile, causing right upper abdominal pain, nausea, vomiting, and fever. This case study adds new data that warm compress therapy is effective in significantly reducing pain levels in cholelithiasis patients with complications of acute kidney injury and liver insufficiency aged 59 years. The method used in this study was the Numerical Pain Rating Scale (NPRS) to assess the level of pain, and observation, interview, physical examination, and hospital medical records were used. The NPRS rating scale is a scale of 0 to 10. The number 0 means no pain while the number 10 indicates maximum pain. The application of warm compress therapy was carried out by placing a cloth soaked in 38°C water on the patient's right upper abdominal area, with a duration of implementation of around 15 to 20 minutes for 4 days. The results showed a significant decrease in pain levels after warm compress therapy. Before the intervention, the pain felt was 7/10, and after the intervention, the pain decreased by 4/10 on the fourth day of the intervention. The role of nurses in non-pharmacological pain management, particularly warm compress therapy, includes roles as nursing care providers, educators, and patient safety advocates. However, this study has limitations in the use of cloth as a compressed medium because the cloth is not able to maintain a stable hot temperature during the intervention. As a result, the temperature received by the patient's body may differ from the initial temperature of the compress. Thus, it is recommended that further researchers use special bags, such as hot water bags, for warm compress therapy so that the hot temperature can be maintained more stably and effectively.

Keywords: Abdominal pain, cholelithiasis, warm compress

Introduction

This is a case of a treatment for warm compress to relieve pain on patients with cholelithiasis. This clinical report efficiently demonstrated pre warm compress intervention decrease in pain of 7/10 by pain scale and post warm compress intervention decrease in pain to 4/10 by scaling. Cholelithiasis is the chronic state of disease of the hepatobiliary system, which is caused by disturbances in the metabolism of cholesterol, bilirubin, and bile acids and is characterized by the formation of gallstones in the gallbladder or hepatic bile duct (Pimpale et al., 2019).

This disease occurs when stone formed in gallbladder clog the bile duct (canals) through which bile flows and cause such complaints as severe abdominal pain in the upper right side of the abdomen, nausea, vomiting, and fever (Arsy & Ratnawati, 2021). Pain may be aggravated on deep breathing and Nausea also may be complained along with the intensity of pain (Adhata et al., 2022).

Cholelithiasis is a disease that is often found in various countries, including Indonesia. The prevalence of cholelithiasis in adults in Indonesia reached 15.4%, which shows an increase compared to 2016 which was recorded at 11.7% (Riskesdas, 2018). Around 700 million people in the world suffered from cholelithiasis in 2016, an increase from 400 million cases in 2014 (World Health Organization, 2016).

Cholelithiasis can be triggered by various factors, one of which is changes in the lifestyle of modern society, especially in the middle to upper economic groups who tend to consume fast food high in cholesterol. This habit can cause increased cholesterol levels in the blood, which then settles in the gallbladder (Siregar et al., 2021). The risk factors for cholelithiasis are known as the "5Fs", namely Fat (overweight or obese), Female (female), Forty (aged over 40 years), Fertile (being of childbearing age or having been pregnant), and Fatty food intolerance (the body's inability to digest and absorb fatty foods) (Siregar et al., 2021).

This cholelithiasis can cause various complications, such as acute cholelithiasis which can cause severe inflammation of the gallbladder leading to leakage (perforation), inflammation of the abdominal cavity (peritonitis), blockage of the bile duct causing yellowing of the skin and eyes (obstructive jaundice), infection, and even inflammation of the pancreas. In the long term, the risk of developing gallbladder cancer can also increase (Jamini & Trihandini, 2023).

Simple non-pharmacological interventions that can reduce pain include warm compress therapy and deep breathing relaxation therapy. Relaxation techniques are one of the health measures aimed at reducing tension or stress, both physically and psychologically, thereby increasing pain tolerance (Butcher et al., 2018). Warm compress therapy was chosen as the primary intervention because it is considered to provide a faster local analgesic effect, increase blood flow, and provide immediate physical and psychological comfort to patients with moderate to severe pain (Şişman & Arslan, 2023). The role of nurses in non-pharmacological pain management, particularly warm compress therapy, includes roles as nursing care providers, educators, and patient safety advocates.

The researcher designed a warm compress therapy intervention on patients with cholelithiasis, which targets pain relief and comfort enhancement. This case report further demonstrates the outcomes of nursing care introducing warm compress therapy intervention based on the patients with cholelithiasis combined with AKI and liver insufficiency.

Research Method

This research applied a case study as a qualitative methodological strategy from which to examine complex phenomena in a natural setting (Cole, 2023). This case study is a specific and detailed plan to guide a research study and helps ensure that all aspects of the study are considered (Fife & Gossner, 2024).

The aim of this case report is to summarize on warm compress therapy since it could contribute to pain relief of Acute Kidney Injury and Liver Insufficiency cholelithiasis patients.The sample of this study was Mr. E 59 years old who was treated in hospital. The study was conducted for 4 days from

September 16, 2024 - September 19, 2024.

The intervention made was Warm Compress Therapy, as it is an effective nonpharmacological intervention to relieve abdominal pain similar to abdominal colic. The warm compress to the patient is carried out with a piece of cloth heated using 38ºC water temperature is put on the upper right abdomen. According to Wang et al. (2022), an optimal temperature between 35 and 40°C is recommended to achieve the physiological effects of warm compresses without the risk of tissue damage. At this temperature, heat therapy provides the following benefits: local blood circulation increases, muscles relax, and the transmission of pain impulses to the spinal cord is leadened. The time of this course is approximately 15-20 minutes – enough to take out the tension and pain.

The outcome measure used in this study was the Numerical Pain Rating Scale (NPRS) to assess pain levels. The NPRS scale ranges from 0 to 10, with 0 indicating no pain and 10 indicating maximum pain. The first measurement was taken before the intervention, and subsequent measurements were taken periodically post-intervention throughout the treatment period. Data collection techniques included observation, interviews, physical examinations, and hospital medical records. Data collection techniques include observation, interviews, physical examinations, and hospital medical records. The collected data are then analyzed and grouped to produce a nursing diagnosis. The nursing diagnosis obtained then becomes a reference for researchers in planning appropriate interventions and evaluations according to the patient's condition.

This study was conducted after obtaining written consent from the patient and the patient's family with an informed consent sheet. During the research process, the principles of nursing ethics were upheld by ensuring the application of values such as honesty, benefit, and avoiding potential harm. In addition, this study also focuses on protecting the privacy of patients and families, as well as maintaining anonymity throughout the study.

Results

Interventions given to patients with pain, one of which is pain management which includes pharmacological and non-pharmacological administration. In this study, one of the nursing diagnoses is Acute pain related to physiological injury agents d.d the client complains of pain in the upper and lower right abdomen when pressed and comes and goes with a pain scale of 7/10, HR 86x/minute, RR 20x/minute, Temperature 36.7 ºC, SpO2 93%, BP 110/60 mmHg. In this condition the client feels severe pain.

Table 1 NPRS results before and after warm compress therapy intervention

Date of Intervention	Time of Intervention	Pain level before intervention	Pain level after intervention
16/09/2024	**10.00**	**7/10**	**6/10**
17/09/2024	**10.30**	**6/10**	**5/10**
18/09/2024	**15.00**	**6/10**	**4/10**
19/09/2024	**09.30**	**5/10**	**4/10**

Table 1. Shows the pain score before and after the intervention. The results showed that there was a significant change in the level of pain after warm compress therapy. Before the intervention, the pain felt was 7/10 and after the intervention the pain decreased by 4/10 on the 4th day of the intervention.

Discussion

This report shows that warm compress therapy treatment is beneficial in decreasing the pain of patients with gallstones. Cholelithias is a chronic disease of the hepatobiliary system due to disturbances in the metabolism of cholesterol, bilirubin and bile acids, is characterized by the formation of gallstones in the gallbladder or in the biliary tract and liver (Pimpale et al., 2019). This disorder is caused by the formation of stones in the gallbladder, but can interfere with the flow of bile and cause symptoms such as severe pain in the right upper abdomen (biliary colic), nausea, vomiting, and fever (Arsy &

Ratnawati, 2021).

Clinically cholelithiasis is often asymptomatic but approximately 20% present with right upper quadrant abdominal pain, which may be colicky, jaundice, along with symptoms of nausea, vomiting, and anorexia (Pimpale et al., 2019). The poilite with pain upper right to lower right abdomen with 7/10. The pain would be on and off but the pain that was so severe felt also very painful. The patient presented with nausea and vomiting and poor appetite.

Warm compress therapy is one of the simple and efficient non-pharmacological interventions in this regard. This treatment can loosen muscles, increase blood circulation, and have a calming effect on your state of mind. Warm application is also an alternative application or a supportive one for pain relief, especially in situations such as muscle tension and cramps, digestive complaints (Şişman & Arslan, 2023). Patients are provided with warm compresses, which consist of a warm cloth with water temperature of 38ºC applied on the upper right abdomen. According to Wang et al. (2022), a temperature of 35–40°C is the optimal temperature to achieve physiological effects of warm compresses without inducing the risk of tissue damage.This case study supports that a warm compress has an effect on pain level as noted by the differences pre and post-intervention. Pre Intervention, the pain was of magnitude 7/10 and by day 4 post intervention, the new pain subsided to a level of 4/10. Research showing the effectiveness of warm compress therapy conducted by Darsini and Praptini (2019) showed that giving warm compresses for 20 minutes was able to significantly reduce the pain scale in patients with abdominal colic. However, the effect of warm compress therapy does not last forever, so it needs to be applied regularly.

Physiologically, this pain reduction occurs through the Gate Control Theory mechanism, in which heat stimulation stimulates large-diameter nerve fibers to inhibit the transmission of pain impulses to the brain. Furthermore, the warm temperature triggers vasodilation of blood vessels, increasing local circulation to remove inflammatory mediators and relaxing gallbladder smooth muscle spasms. While effective, the effects of this therapy are temporary, requiring regular and consistent application to maintain the patient's ongoing physical and psychological comfort.

This case can offer teachings in the knowledge aspect of evidence that nonpharmacological therapies such as warm compress are effective in pain relief, imposing a safer and easier management. Nurses are actively involved in pain assessment and choosing and providing nonpharmacologic interventions like warm compress, based on indications and effects. This is a prostitution approach that takes into thas the physical and mental state prostitute in ny the prostitute. Application of warm compresses as per protocols and evidence further enhances quality of care particularly in patients with cholelithiasis with complications.

In this case study it is a disadvantage that the warm compress medium was cloth. When applied to the patient's body, the cloth cannot keep a constant hot temperature, so the received temperature is not equal to the original temperature. What's more, for hot sterilization, it is more preferable to employ a special bag, for example hot water bag, so as to be able to more stably and effectively maintain the hot temperature.

Conclusion

Warm compress therapy can be especially useful in managing pain for patients suffering from cholelithiasis. Utilizing a warm compress at 38ºC for 15-20 minutes daily reduces pain from a 7/10 to a 4/10 within four days. Furthermore, this form of compression relaxes muscles, improves blood flow, enhances circulation, and elevates the patient's mental well-being.

Therapeutic warm compresses not only alleviate discomfort effectively, but are safe for patients who require restricted pharmacological treatment. This is particularly relevant in cases such as cholelithiasis following acute kidney injury and liver failure complications. In this scenario, deep breathing relaxation would be less beneficial than the chosen approach because it typically applies to low and moderate levels of pain.

Following a warm compress treatment session, clients often express surprise about

their ability to relieve discomfort through such simple methods. However, after being educated, the client said that this method was very helpful in reducing the pain he felt. The client also said that warm compresses provided significant benefits in relieving pain, as a complement to the use of medication.

The patient and family agreed to the implementation of warm compress therapy as an effort to reduce pain, by signing an informed consent sheet with the family. During the research process, the patient also stated his/her agreement that all personal identities would be kept confidential and remain anonymous. Nurses have an important role in assessing, selecting, implementing, and evaluating interventions, so that non-pharmacological interventions such as warm compresses can improve the quality of nursing care holistically.

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