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Description Analysis of Warm Compress, NaCl 0,9%, and Aloe Vera Gel on Flebitis Degress in Children at Prof. Dr. Margono Soekarjo Purwokerto Hospital

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ABSTRACT

Phlebitis is a nosocomial infection caused by microorganisms and is characterized by clinical symptoms experienced by patients for 3x24 hours during the treatment period in the hospital. Appropriate handling both pharmacological and non-pharmacological in phlebitis can help minimize pain and injury in children. Compress is an alternative non-pharmacological treatment that can be done using several types of compresses, namely warm compresses, 0.9% NaCl compresses and aloe vera gel compresses. This type of research is quantitative research with descriptive analytic research design. The sample used amounted to 15 respondents children who are treated in the aster room of Prof. Dr. Margono Soekarjo Purwokerto Hospital with incidental sampling technique. The main variable in this study is the degree of phlebitis. This research data analysis is carried out interactively, in which there are three components, namely data reduction, data display, and conclusion drawing. The degree of phlebitis in children decreased every day after giving warm compresses, 0.9% NaCl compresses and aloe vera gel compresses and did not cause side effects during the intervention process with an average decrease on days 2 and 3. The results of giving warm compresses to 5 respondents showed a decrease in the degree of phlebitis with an average value of degree of phlebitis 3 to degree of phlebitis 2. While giving 0.9% NaCl compress 1 respondent recovered from phlebitis with a degree score of 0 from the previous degree score of 2. For the administration of aloe vera gel compresses on 5 respondents showed a decrease with an average value of degree of phlebitis 2 to 0 and 4 of the total 5 respondents given the intervention showed a degree score of 0 or recovered from phlebitis. Giving compresses helps reduce the degree of phlebitis in children so that it can be used as an alternative intervention against the incidence of phlebitis in children.

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1. INTRODUCTION

A child is defined as someone who is less than 18 (eighteen) years old during the growth and development period from infancy to puberty, children experience various developmental changes. Depending on the stage of development, children have special needs related to physical, psychological, social, or spiritual needs [1]. During the process of growth and development, a child certainly experiences changes to his or her health condition that require the role of health services. Care and treatment plans are based on the needs and conditions of the patient while being treated, one of the common actions taken is the installation of an IV. By using intravenous blood vessels, infusions can fulfill the needs of nutrition, blood transfusions, electrolytes, fluids, and/or chemotherapy [2]. Infusion in children is not an easy task because children have small and fragile veins, so it is common to encounter repeated infusion due to failed intra-venous cannula placement. This can cause physical injury and discomfort, anxiety and trauma in children.

Prolonged infusion will also lead to complications in the patient's health, which of course disrupts the patient's comfort level. Some of the complications of infusion include bleeding, infection, phlebitis, infiltration, and fluid overload. However, phlebitis is the most common in children [3] Phlebitis is a nosocomial infection caused by microorganisms and is characterized by clinical symptoms experienced by patients for 3x 24 hours during hospitalization. Signs include pain, edema, redness along the veins, fever in the insertion area, and decreased infusion flow velocity. Internal factors that can cause phlebitis include age, nutritional status, stress levels, vascular health, the presence of IVs in hospitalized patients, and gender [4]. According to a study conducted by [5], out of 21 respondents who were infused for more than 72 hours (≥ 3 days), 16 respondents (27.6%) reported phlebitis, while 5 respondents (8.6%) did not experience phlebitis.

Meanwhile, 4 respondents (6.9%) out of 37 respondents who were infused for 48 to 72 hours (≤ 3 days) experienced phlebitis, while 33 respondents (56.9%) did not experience phlebitis [5]. Furthermore, a study by Asrin and colleagues published in the 2010 edition of the Soedirman Nursing Journal revealed that out of 74 patients, 17 of them experienced phlebitis (22.9%). Catheter size and material, length of time of iv catheter insertion, selection of insertion site, type of puncture site cover, insertion technique, and sterility of intravenous therapy treatment were factors that influenced the incidence of phlebitis, according to the findings of the study. According to Aprilin, 2 (10%) of 20 respondents who did not receive infusion treatment, and 6 (30%) suffered from phlebitis [6]. Phlebitis is the fourth most common infection among hospitalized patients according to Centers for Disease Control and Prevention (CDC) data [7].

Data from the World Health Organization (WHO) shows that 5% of phlebitis cases occur annually. Data from 55 hospitals in 14 countries that conducted prevalence surveys showed that 8.5% of hospital patients experienced phlebitis [8]. Phlebitis is the most common nosocomial disease in Indonesia, which is 16,435 out of 588,328 cases. About 293 out of 18,800 at-risk patients in specialized or private hospitals developed phlebitis, while 328 patients, or 2.8%, were at-risk in public hospitals. The incidence of phlebitis increased from 1.5% in 2006 to 50.11% in public hospitals and 32.70% in private hospitals in 2021 [9]. After West Java with 2.2% and East Java with 0.5%, Central Java Province has the second highest percentage of phlebitis at 0.8% [10]. Phlebitis can be cured with proper treatment, which involves medication/pharmacological or nonpharmacological means. The goal of treatment is to minimize or completely eliminate discomfort to ensure the patient is comfortable.

By using analgesic and antiinflammatory drugs, nurses can treat phlebitis pharmacologically. The goal is to reduce inflammation and relieve pain associated with phlebitis. In addition, non-pharmacological therapies can also be given to phlebitis patients such as warm compresses given by nurses to promote relaxation, distraction, and skin stimulation [11]. The ability to quickly determine interventions to treat phlebitis can help minimize pain and injury in children. Nonpharmacological methods of treating phlebitis in children vary, namely by giving normal saline or NaCl 0.9% compresses, warm compresses and other alternatives such as aloe vera gel compresses. Each of these intervention measures certainly has the same goal and target value, only the onset of the decrease in the degree of phlebitis varies in each patient [1]. According to research by [12], giving warm compresses can help reduce the degree of pain in patients with phlebitis at Royal Prima Hospital. Most patients with phlebitis experienced moderate pain (pain scale 5) before receiving warm compress therapy.

On the other hand, most patients reported mild pain (pain scale 2) after warm compress therapy. According to research by [13], said 91% of patients experienced moderate phlebitis before compressing and as many as 82% of patients experienced changes that did not look like phlebitis after compressing. Furthermore, research conducted [1] in the Children's Room of Dr. Chasbullah Abdulmadjid Hospital, Bekasi City found that aloe vera compresses had an effect on reducing the degree of phlebitis. Giving aloe vera compresses is beneficial and proven effective for treating phlebitis in children. Based on the results of preliminary studies conducted at the research site, namely Prof.Dr. Margono Soekarjo Purwokerto Hospital, it was found that the incidence of phlebitis was included in the category of Healthcare Associated Infections (HAis) with a prevalence per one year in 2022 was 7.4% with a total incidence of 22 cases with phlebitis [14]. Based on the results of the preliminary study and research that has been done before, it is necessary to have further treatment both pharmacological and non-pharmacological related to phlebitis.

This phenomenon illustrates that there is still a significant incidence of phlebitis in the pediatric inpatient room of Prof. Dr. Margono Soekarjo Purwokerto Hospital, so the authors are interested in describing the effectiveness of several compress interventions on the incidence of phlebitis in the field. Providing the type of compress given in phlebitis cases between theory and reality in the field can cause gaps in the provision of nursing care in children. Therefore, pediatric nurses must be able to determine the most appropriate compress among warm water compresses, normal saline or NaCl 0.9% compresses, and aloe vera gel compresses for the management of phlebitis.The purpose of this study was to describe the provision of warm compresses, compresses with 0.9% NaCl and compresses using aloe vera gel on the degree of phlebitis in children.

2. RESEARCH METHOD

This research is a quantitative study with a descriptive design that aims to describe or describe a phenomenon that occurs in the population, namely the effect of warm compresses, NaCl 0.9%, and aloe vera gel on the degree of phlebitis in children who are treated in the aster room of Prof. Dr. Margono Soekarjo Purwokerto Hospital. Descriptive design allows researchers to collect data that can be measured and analyzed statistically [15]. The sample criteria followed the provisions of the exclusion criteria, namely children with phlebitis conditions not due to infusion and pediatric patients with a treatment process < 2 days. While quantitative research allows for more objective and systematic measurements. In the context of this study, researchers measured the degree of phlebitis quantitatively so that the results could be compared and analyzed clearly.

The research process was carried out in the Aster room of Prof. Dr. Margono Soekarjo Purwokerto Hospital and was carried out in March and April 2024. The number of child participants who experienced phlebitis during the treatment period was 15 people. In taking the number of samples in this study is with incidental sampling technique, where the sampling process is based on the incidence of phlebitis caused by infusion in the Aster room.

This study used a standardized instrument from the VIP Score (Visual Infusion Phlebitis Score} from Andrew Jacson. There are no validity and reliability test results because we use existing instruments. Data collection techniques used observation, interview, and documentation methods. This research data analysis is carried out interactively, in which there are three components, namely data reduction, data display, and conclusion drawing Data were analyzed by reducing data, displaying data, and drawing conclusions [16]. Researchers conducted ethical research permits at Prof. Dr. Margono Soekarjo Purwokerto Hospital with Research Ethics Approval Number: 420/02557

3. RESULTS AND DISCUSSIONS

a. Characteristics of Gender, Education, Occupation and Age

Table 1. Description Table of Gender, Education, Occupation and Age of Respondents at RSUD Prof. Dr. Margono Soekarjo Purwokerto

Characteristics	Frequency (f)	Presentase (%)
Jenis Kelamin		
Male	20	48,8
Female	21	51,2
Education		
Elementary school	5	12,2
Junior high school	7	17,1
Senior high school	10	24,4
College	19	46,3
Jobs		
Government employees	9	22,0
Housewife	10	24,0
Private	22	56,0
Age		
< 30 th	3	7,3
31-40 th	4	9,8
41-50 th	21	51,2
51-60 th	10	24,4
> 61 th	3	7,3
Total	41	100,0

Table 1 shows that the majority of female respondents are 21 (51.2%) respondents, with the educational level of the majority of tertiary institutions (PT) 19 (46.5%) of respondents, then the majority are private sector workers. There are 22 (56.0%) respondents and the majority aged 41 to 50 years are 21 (51.4%) respondents.

b. The Level of Knowledge of The Family, The Distance at Home of The Stroke Sufferer and The Speed at Which The Family Carries The Stroke Sufferer

Table 2. Table Description of The Level of Knowledge of The Family, Distance to Home of The Stroke Sufferer, Type of Transportation and Time of Arrival of The Stroke Patient in The IGD RSUD Prof DR Margono Soekarjo Purwokerto

Variabel	Frequency (f)	Percentage (%)
Family knowledge level		
Less	13	31,7
Enough	8	19,5
Good	20	48,8
Total	41	100,0
Distance from home		
Near (<10 km)	20	48,8
Middle (11-20 km)	7	17,1
Far (> 21 km)	14	34,1
Total	41	100,0
Trasportation Type		
Ambulance	12	29,3
Private Car	29	70,7
Total	41	100,0
Time of arrival		
According to golden time	24	58,5
Beyond the golden time	17	41,5
Total	41	100,0

Table 2 shows that the majority of respondents who have good knowledge are 20 (48.8%) respondents, distance between home and IGD RSMS < 10 iKM i(near) as many as 20 (48.8%) respondents, then type transportation which is used for. The majority of stroke patients who were taken to the RSMS emergency room used private vehicles, 29 (70.7%) respondents. The time most frequently used to bring istroke patients to the ER RSMS is golden time, 24 (58.5%) respondents.

c. Analysis of The Relationship Between The Level of Family Knowledge About Stroke and The Length of Time A Stroke Patient Arrives at The RSMS IGD

Table 3. Relationship Between Level of Knowledge and Age

Level of family knowledge about stroke	Stroke patient arrival time		Total	P *Value*
	< 4,5 hour Frequency (%)	> 4,5 hour Frequency (%)		
Less	1 (2,45)	12 (29,4)	13 (31,7)	0,01
Enough	4 (9,75)	4 (9,7)	8 (19,5)	
Good	19 (46,3)	1 (2,4)	20 (48,8)	
Total	24 (58,5)	17 (41,5)	41 (100)	

Table 3 shows the family's knowledge about stroke and the time of arrival of the stroke patient in the ER, RSMS <4.5 hours is as much as 24 (58.5%), there is a relationship between the level of family knowledge about stroke and the speed at which the family carries the stroke sufferer. hospital with the value of p 0.01 (<0.05).

1. Decrease in the degree of phlebitis in children with warm water compresses

   Based on 5 respondents who were intervened with warm water compresses, 2 out of 5 respondents showed a decrease in the degree of phlebitis on the third day of the intervention process, namely from phlebitis degree 3 to phlebitis degree 2.

2. Decrease in the degree of phlebitis in children with 0.9% NaCl compresses
   Based on 5 respondents who were intervened with 0.9% NaCl compress, each respondent showed a decrease in the degree of phlebitis every day, but only 1 respondent experienced a decrease in the degree of phlebitis with a degree score of 0 from the previous degree score of 3 during the intervention process.
3. Decrease in the degree of phlebitis in children with aloevera gel compresses
   Based on 5 respondents who were intervened with warm water compresses, each respondent showed a decrease in the degree of phlebitis every day. On the third day of intervention, 4 out of 5 respondents experienced a decrease in the degree of phlebitis with a phlebitis degree score of 0 from a phlebitis degree score of 3.

d. Research Discussion

1. Analysis of the Degree of Phlebitis by Giving Warm Water Compresses

The results of giving warm water compresses to 5 respondents on reducing the degree of phlebitis showed a decrease with an average value of phlebitis degree 3 to phlebitis degree 2. The results of this decrease occurred during the three days of treatment. The results of this study are the same as research conducted by [12] that giving warm compresses can help reduce the degree of pain in phlebitis patients while in the treatment room. Intervention with warm compresses can minimize inflammation, reduce muscle pain stiffness and accelerate soft tissue healing.

Warm compress is an action to reduce pain by providing heat energy through the conduction process, where the heat can cause vasodilation (widening of blood vessels) so as to increase the intake of oxygen, nutrients and blood leukocytes leading to body tissues. The feeling of warmth felt on the body physiologically can reduce the amount of blood flowing, decrease muscle tension. In addition, warm water compresses can also increase comfort so that the pain gradually disappears [17].

According to potter & perry who stated that warm compresses on the phlebitis area can improve blood flow reduce swelling in the area experiencing phlebitis. Warm compresses provide a sense of warmth and provide a sense of comfort, reduce pain, reduce muscle spasm, and provide a sense of warmth in certain areas. Warm compresses can reduce patient pain by using fluids that function to dilate blood vessels and increase local blood flow [18].

Giving warm water compresses to the area experiencing phlebitis can cause venous vasodilation and prevent veins from becoming thrombosed / blocked and increase blood flow so that swelling decreases [19]. This happens because water helps regulate body temperature, remove toxins, and stimulate or calm the nervous system. Giving a warm compress on the body area will give a signal to the hypothalamus through the spinal cord. When heat-sensitive receptors in the hypothalamus are stimulated, the effector system releases signals that initiate sweating and peripheral vasodilation. In addition, water in the compress can also help the process of tissue epithelialization so as to accelerate the wound healing process without causing negative impacts on patients who experience wounds.

Researchers assume that to reduce the degree of pain in patients with phlebitis, what is done is to provide warm compresses to patients because warm compresses are one of the pain treatments by providing heat energy through conduction, where the heat can cause vasodilation (widening of blood vessels), increase muscle relaxation so as to improve circulation and increase the intake of oxygen, and nutrients to the tissues. Then the wound in phlebitis is an open wound that can become a port d'entry of bacteria or viruses into the body and result in infection. Therefore, giving warm water compresses is appropriate for pediatric patients with phlebitis to reduce the degree of phlebitis and other complications such as pain and prevent the risk of infection.

2. Analysis of the Degree of Phlebitis by Giving 0.9% NaCl Compression

The results of the study of giving 0.9% NaCl compresses to 5 respondents with phlebitis showed a decrease in the degree of phlebitis every day with an average value of phlebitis degree 3 to phlebitis degree 2-1, and 1 respondent showed phlebitis degree 0 or recovered from phlebitis.... Giving normal saline compresses to patients experiencing phlebitis aims to reduce symptoms of erythema around the phlebitis area and provide comfort to patients experiencing phlebitis. The results of this study are the same as research conducted by [1] which states that applying 0.9% NaCl compresses every 8 hours for 20 minutes for 2 days can reduce pain due to phlebitis in children and help the process of tissue granulation and rapid wound healing. Research conducted by [13] also states if there is an effect on reducing the degree of phlebitis in children with 0.9% NaCl compress in the treatment room of Panti Waluya Sawahan Hospital Malang. These results are supported because NaCl 0.9% is a high osmolarity material so that it can help the healing process.

NaCl 0.9% has an anti-inflammatory response so that it can reduce symptoms of pain and erythema that arise in the wound, as well as increase blood flow to the wound area, thus accelerating the wound healing process. In addition to reducing the degree of phlebitis, the administration of normal saline compresses does not cause any side effects in patients who experience infection. Giving normal saline compresses to patients with phlebitis aims

to reduce symptoms of erythema, pain, and edema in the area around phlebitis so that it can help reduce the degree of phlebitis and provide comfort to patients with phlebitis.

In patients who experience phlebitis with problems in tissue perfusion should be given a normal 0.9% saline compress because it does not provide cold stimulation that can cause vasoconstriction of blood vessels, resulting in obstructed blood flow to the phlebitis wound area. The isotonic nature of the fluid can reduce the degree of phlebitis. Decreasing the degree of phlebitis takes time, in this intervention can be applied in nursing practice so that patients who experience phlebitis can experience a decrease in the degree of phlebitis and get comfort.

Wounds on the epidermis of the skin that are left exposed to air without treatment take 67 days to revitalize, but wounds treated with moist compresses can revitalize in less than 4 days. This happens because the compress provides a moist environment that helps cells migrate and proliferate faster, so that the wound healing phase can take place faster. Wound care performed on phlebitis patients is expected to help heal the symptoms of phlebitis. According to [20] the symptoms that arise as a result of inflammation of the blood vessels respond to the epidermal layer which lasts about 24 hours to 48 hours and the process of tissue revitalization can occur within 48 hours.

Compresses with 0.9% NaCl are nonirritating, non-destructive to new tissue, protect granulation tissue from dry conditions, maintain moisture around the wound, do not affect the function of fibroblasts and keratinocytes in wound healing, help antiinflammatory responses and improve blood circulation, thereby accelerating the process of pain, redness, and edema [20].

0.9% NaCl compress proved to be more effective in reducing the degree of phlebitis. Researchers assume that the type of infusion fluid has an impact on the risk of phlebitis if the management of its administration is not in accordance with standard operating procedures such as how to administer, calculate the infusion speed, understand the function of the type of infusion fluid must be adjusted to the conditions of handling patient emergencies and still maintain the sterilization of the infusion fluid itself when installing or changing infusion fluid.

3. Analysis of the Degree of Phlebitis by Giving Aloe Vera Gel Compresses

Research with compresses with aloe vera gel on 5 respondents showed a decrease in the degree of phlebitis with an average value of phlebitis degree 2 to phlebitis degree 0 and the total respondents who showed a decrease in phlebitis degree 0 or recovered from phlebitis were 4 out of a total of 5 respondents given the intervention. These results are more influential than several other compress interventions in reducing the degree of phlebitis in children. This study is the same as [21] previous research on the effect of aloe vera gel compresses on phlebitis revealed that in both research subjects the degree of phlebitis decreased from grade 3 to grade 0. The results of another study conducted by [1] in the Pediatric Room of Dr. Chasbullah Abdul Madjid Hospital, Bekasi City, found that there was an effect of aloe vera compress on reducing the degree of phlebitis and it can be concluded that the application of aloe vera gel compresses is effective and useful in treating phlebitis in children.

Aloe vera compress is one of the alternative treatments for phlebitis. Aloe vera has advantages, including being easy to obtain and does not cause extravasation because it does not have electrolytes in high concentrations. Aloe vera also contains 20 types of amino acids and salicylic acid which are anti-inflammatory and anti-bacterial. The lignin content of aloe vera facilitates the penetration of these substances into the skin. In addition, aloe vera content causes less allergic effects on children's sensitive skin [22].

Giving aloe vera is considered safer to give to children considering that aloe vera does not contain electrolytes that can cause extravasation in blood vessels [23]. Aloe vera contains 75 active content substances such as vitamins, enzymes, lignin, sugars, saponins, salicylic acid, amino acids, some of which have pharmacological reactions and contain secondary metabolites namely aloe emodin and chrysophanol [24]. These substances act as immune system effects, moisturizing, anti-aging, and anti-septic substances. In addition, Aloe vera contains carboxypeptidase which inhibits the activation of bradykinin, salicylate which also inhibits the vasoconstriction process. C-glucosyl chromone, one of the ingredients of aloe vera, is an anti-inflammatory. The content of this substance is able to reduce the inflammatory process that occurs by inhibiting the release of cyclooxygenase and suppressing the production of prostaglandin E2 [25].

Giving aloe vera compresses has an effect on reducing the level of phlebitis, the content in aloe vera which is very supportive for the process of reducing the degree of phlebitis in children. in line with the research of [26] in the statistical test results resulted in a p value of 0.000 (<0.05), there is an effect of handling phlebitis with aloe vera on reducing phlebitis in children.

Researcher analysis by looking at some of the results of previous studies concluded that the provision of aloe vera gel compresses was proven to be effective and beneficial in the management of phlebitis in children. Besides being easy to obtain because it is sold freely on the market, from an economic point of view, this intervention has a cost effective and cost efficient to be applied in hospitals.

e. Practical Recommendations for Nurses in Managing Pediatric Phlebitis in Hospitals

1. IV Site Selection and Insertion Technique

Nurses should choose the site of intravenous (IV) insertion carefully, considering the size and comfort of the child. The use of small-sized cannula needles appropriate for the age and condition of the child's veins is essential to minimize the risk of trauma to the veins. In addition, strict aseptic technique during IV insertion should be applied to reduce the risk of infection that may trigger phlebitis. Ensuring secure but not too tight fixation of the catheter also helps prevent irritation to the surrounding area.

2. Routine Monitoring and Early Detection

Nurses need to perform regular monitoring of the IV insertion area, including watching for early signs of phlebitis such as redness, swelling, pain, or increased temperature around the site. Early detection allows for immediate action to prevent the development of a more severe condition. The use of a phlebitis grading scale, such as the Visual Infusion Phlebitis (VIP) Score, can assist nurses in objectively assessing the severity of phlebitis.

3. Periodic Catheter Replacement and Maintenance

Intravenous catheters in children should be replaced periodically according to hospital protocols or clinical guideline recommendations, even if there are no signs of phlebitis. Nurses also need to ensure the cleanliness of the IV insertion area by sanitizing it with an appropriate antiseptic before manipulation or bandage change to prevent contamination.

4. Education and Collaboration with Parents

Involving parents in monitoring the child's condition is very important, as they spend more time with the patient. Nurses can educate parents on the signs of phlebitis and the steps to take if they spot it. This collaboration not only improves early detection but also provides a sense of security for parents.

5. Treating Phlebitis Quickly and Effectively

If phlebitis is detected, the nurse should immediately stop the catheter use in the infected vein and change the IV site to another area. Warm compresses can be used to relieve pain and promote healing. Topical administration of anti-inflammatory drugs or antibiotics according to the doctor's instructions may also help with phlebitis. Good documentation of the occurrence of phlebitis as well as the actions taken is essential for further evaluation and taking preventive measures in the future.

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