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Original Research Article

The effect of characteristics and cool pack on reducing intensity of infustion pain in children in hospital

Mareta Arkhriansyah*, Raden Surahmat

Department of Public Health, Bina Husada College of Health Sciences, Bina Husada, Palembang, Indonesia

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***Correspondence:**
Mareta Arkhriansyah,
E-mail: mareta85akhriansyah@gmail.com

ABSTRACT

Background: Intravenous therapy is a type of therapy that is mostly given to pediatric patients who are treated with infusion. Giving this therapy will cause discomfort to the child by inserting a needle into the child's blood vessel which can cause pain. So that syringes are generally feared/hated by children when hospitalized. Untreated pain can have a detrimental impact on children, including anxiety, difficulty sleeping, helplessness and hopelessness. So it is necessary to have complementary therapy with cool packs (cold compresses) is one of the nursing actions that can reduce pain by providing a local anaesthetic effect on the area to be inserted infusion. This study aims to study the effect of cool packs (cold compresses) on pain during infusion in children.

Methods: This study uses a Quasy experiment design with a two group Posttest design approach. This study was conducted on children before infusion by giving cold compresses in the infusion area with an intervention group of 15 respondents and a control group of 15 respondents. Pain measurement using the face, legs, activity, cry and consolability (FLACC) scala observation sheet. Data analysis in this study used univariate and bivariate statistical tests using independent t-test.

Results: The results showed that the average pain scale for the intervention group with the cool pack was 3.93 with a standard deviation of 1.033, while in the control group the pain intensity was 7.40 with a standard deviation of 1.242. So we get the effect of Cool Pack on the intervention group and control group with a P value of 0.000.

Conclusions: There is an effect of cool packs (cold compresses) on pain during infusion in children.

Keywords: Pain, Infusion, Cool pack, Cold compress

INTRODUCTION

Intravenous therapy is a type of therapy that is often given to children when they are treated, especially in the intensive care unit. Approximately 80% of pediatric patients receive infusion therapy in hospital.[1] Therapy aims to replace lost fluids, electrolyte correction, blood transfusion, or for medication.[2] Giving this therapy will cause discomfort to the child by inserting a needle into the child's blood vessel which can cause pain.[3] So that syringes are generally feared/hated by children when hospitalized.[4] Untreated pain can have a detrimental impact on children including anxiety, difficulty sleeping, helplessness, hopelessness and the risk of repeated infusions.[5] In the United States, approximately 150 million children who are hospitalized receive intravenous infusion.[6] 2018 National socio-economic survey (Susenas) 3.49% of children experienced health complaints and were hospitalized in the last year with infusions. According to the Indonesian health demographic survey (2017), the percentage of children brought to health facilities is 90% with various diseases. In South Sumatra, there are 576,240 children in which 80.5% of children are treated for intravenous infusion.[7]

Efforts to reduce pain can be done through pharmacological therapy, namely by using drugs and non-pharmacological therapy without using drugs. So there is a need for complementary therapy with cool packs (cold compresses) is one of the nursing actions that can reduce pain by providing a local anesthetic effect in the area to be inserted infusion.[8] Cool pack (cold compress) is a suitable non-pharmacological therapy given before infusion. Cold will cause numbness before pain occurs. Cold compresses can cause a local anesthetic effect on puncture wounds due to infusion.[9] Cold compresses using ice slow the conduction of peripheral nerve fibers and reduce the release of pain mediators and nociceptors, causing a relatively rapid skin anesthetic effect.[8]

Cold compress application method of action that can relieve pain and can promote healing. Cold compresses can relieve pain by slowing the speed of nerve conduction and inhibiting nerve impulses, causing numbness and increasing the pain threshold and can have a local anesthetic effect. The ice gel compress used was of medium size at a temperature of <10°C. The ice gel had been frozen in the freezer for 8 hours. put ice gel on the wrist that will be infused to distract the child from pain during infusion, cold compresses are given for 5-10 minutes before the infusion action.[10-12] According to Lakshmi et al reported an average difference of pain in the treatment group and the control group was 3.7 with a p value of 0.000, indicating no effect of dinginterhadap compress pain during infusion in children.[13] Fatriansari (2019) also said cold compresses reduce pain during infusion.[14] Kiran cold compresses are effective in reducing pain during infusion.[15,16] The purpose of the study was to study the effect of cool packs (cold compresses) on pain during infusion in children.

METHODS

This study used a Quasy Experiment design with a Two Group Posttest design approach involving 15 children as the intervention group and 15 children as the control group. This research will be carried out by the Palembang city hospital. The data collection tool used was an observation sheet containing a pain scale using face, legs, activity, cry and consolability. The way of collecting data starts from determining the sample. With the inclusion criteria of children aged 3-6 years, children who get an infusion. Cool pack (cold compress) is used before the infusion is placed on the area to be inserted by infusion using medium-sized ice-gel that has been frozen for 8 hours, put the wrist to be infused to divert attention to pain in children during infusion for 5-hours, 10 minutes. All respondents were given cold compresses before the infusion. Data analysis was performed with computer software. Univariate analysis was carried out on the data of the sex of the child and the pain scale and post-test. Bivariate analysis was performed by independent t-test.

RESULTS

The sexes in the control group consisted of 6 (40%) men and 9 (60%) women, while in the intervention group there were 7 (47%) men and 8 (53%) women (Table 1).

Table 1: Frequency distribution of characteristics in children in Palembang city hospital.

Variables	Intervention group		Control group	
	N	%	N	%
Gender				
Man	7	47	6	40
Woman	8	53	9	60
Age (years)				
3-4	6	40	8	53
5-6	9	60	7	47
Total	15	100	15	100

Age groups 3-4 and 5-6 respectively amounted to 8 (53%) and 7 (47%) in the control group and 6 (40%) and 9 (60%) in the intervention group. An average intersitas pain intervention respondents is 3.93 with a standard deviation of 1.033 and a minimum of pain intensity is 2 and maximum pain intensity was 5 (Table 2).

Table 2: Average pain intensity giving cool pack (cold compress) during infusion installation in children in the intervention group at the Palembang city hospital.

Variable	Mean	SD	Range	N
Intervention group	3.93	1.033	2-5	15

Diperoleh average pain intensity responder control group was 7.40 with a standard deviation of 1.242 and Intensity minimum pain is 5 and maximum pain intensity is 9 (Table 3).

Table 3: Average pain intensity during infusion in control group children at the Palembang city hospital.

Variable	Mean	SD	Range	N
Control group	7.40	1.242	5-9	15

The average effect of cool pack (cold compress) on pain during infusion in children in Palembang City Hospital, the control group and the intervention group are 3,467 with a standard deviation of 0.417 (Table 4). And the results of statistical tests using an independent t test obtained p=0.000 ($p \leq 0.05$), then there is the effect of cool pack (cold compress) on pain during infusion in children.

DISCUSSION

The results of the study found that the average difference in the child's pain scale during infusion of the control group and the intervention group after being given a cold compress was 3.467 with a standard deviation of

0.417. The results of the t-test statistical test obtained a value of p=0.000, meaning that at 0.05 it was seen that there was an effect of cool packs (cold compresses) on pain during infusion in children. The results of this study are in line with Fatriansari's research in 2019, it was found that there was an effect of cold compresses on reducing the pain scale of intravenous injection in pre-school children at the hospital. Bhayangkara Palembang with p value 0.011.

Table 4: Effect of cool pack (cold compress) on pain during infusion installation in children at the Palembang city hospital.

Variable	Mean difference	SD	P value	N
The average effect of cool packs on pain during infusion in children at the Palembang city hospital control and intervention group	3,467	0.417	0.000	30

The theory of pain defense (gate control) from Melzack and Wall states that pain impulses can be regulated or inhibited by defense mechanisms throughout the central nervous system. Giving cold compresses will stimulate the descending nerve pathways to release endogenous opiates such as endorphins and dynorphins which are natural pain killers that come from the body. Giving cold compresses can also stimulate neuromodulators to close the defense mechanism by inhibiting the release of substance P.[9] Children who are infusion will experience tissue damage which will stimulate pain nociceptors which will be transmitted to the brain. However, the presence of a cold compress on the area to be infusion will inhibit the release of substance P which can inhibit pain from reaching the brain.[16]

CONCLUSION

The application of a cooling agent in the form of an ice tube is very helpful in minimizing pain because the effect is felt more quickly by the body, this is due to the process of spreading it through nerves and blood vessels. The effect of this ice tube can be felt for 10 minutes after applying the ice tube for 1 minute. This ice tube material is also safe because the temperature is not too low and the application time on healthy tissue is not too long.

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REFERENCES

1. Zheng GH, Yang L, Chen HY, Chu JF, Mei L. Aloe vera for prevention and treatment of infusion phlebitis. Cochrane Database Syst Rev. 2014;2014(6):CD009162.
2. Lavery I, Ingram P. Safe practice in intravenous medicines administration. Nursing Std. 2008;22(46): 44-7.
3. Foster L, Wallis M, Paterson B, James H. A descriptive study of peripheral intravenous catheters in patients admitted to a pediatric unit in one Australian hospital. J Infus Nurs. 2002;25(3):159-67.
4. Cohen LL, MacLaren JE, Lim CS. Pain and pain management. In: Steele, RG, Elkin, TD, Roberts, MC eds. Handbook of evidence-based therapies for children and adolescents. New York: Springer Publishers; 2007.
5. Gallant P, Schultz AA. Evaluation of a visual infusion phlebitis scale for determining appropriate discontinuation of peripheral intravenous catheters. J Infus Nurs. 2006;29(6):338-45.
6. Waterhouse A. Cryotherapeutic topical analgesics for pediatric intravenous catheter placement: ice versus vapocoolant spray. Pediart Emerg Care. 2013;34:2
7. Fauzi I, Hendayani N. The Effect of Cold Compress on Pain in Infusion Procedures for Pre-School Children at Bendan Hospital, Pekalongan City. Muhammadiyah Pekajangan. 2013,
8. Sadeghi T, Mohammadi N, Shamshiri M, Bagherzadeh R, Hossinkhani N. Effect of distraction on children's pain during intravenous catheter insertion. J Spec Pediatr Nurs. 2013;18:109-14.
9. Canbulat N, Ayhan F, Inal S. Effectiveness of external cold and vibration for procedural pain relief during peripheral intravenous cannulation in pediatric patients. Pain Manag Nurs. 2015;16(1):33-9.
10. Laksmi IG, Suryati NM, Yanti NL. The effect of cold compress on pain during infusion in preschool age children. BMJ. 2018;5(2):198-209.
11. Asih F. The Effect of Cold Compress on Reduction in Pain Scale of Infusion in Babul Ilmi Pre-School Children. J Sci Multi Sci Health. 2019.
12. Kiran N, Kaur S, Marwaha RK. Effect of ice pack application at the prior site to vernipuncture on the level of pain of school-age children intensity of pain among children. during infusion with a p value of 0.000. Nurs Midwif Res J. 2019;9(14):160-7.
13. Wang ZX, Sun LH, Chen AP. The efficacy of non-harmacological methods of pain management in school age children receiving venouspuncture in a pediatric department: A randomized controlled trial

of audiovisual distractin and routine psychological intervention. Swiss Med. 2008;138(39-40):579-84.
14. Weinstein SM. Intravenous therapy. 2nd ed. Jakarta: EGC publishers; 2010.
15. Glasper A, Richardson J. A textbook of children and young peoples nursing. London: Elseiver; 2016.
16. Potts NL, Manleco CL. Pediatric nursing caring for children and families. 2nd ed. Canada: Thompson Delmar Learning; 2007.

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