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Effect of Cold Application on Pain Relief During Intravenous cannulation for Cancer Patients

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Abstract

Background: The intravenous cannulation it's a painful process can cause tension and anxiety, it is rarely followed by analgesia.

Objective: study aimed to determine the effect of cold on the level of pain during intravenous cannulation.

Methodology: From January 4, 2024, until February3, 2024, a randomized controlled experiment was conducted in the oncology unit of AL-Al-Haboubi Teaching Hospital in Dhi-Qar. To accomplish the goal of the study, 102 patients were split into two groups after the sample was chosen from among them: 50 patients were placed in the control group and 52 patients in the experimental group. Cold gel was applied to the experimental group, and self-report data collecting was employed. Pain was measured using a 10-cm visual analogue scale.

Results: The post-test results for the experimental group revealed a low mean pain score (28.76+20.491), whereas the data analysis results for the control group indicated severe pain during cannulation insertion and a high mean score (M+SD 76.54+20.427). After applying cold therapy, there was a high significant difference in the mean pain score among the control and experimental groups during cannulation insertion (p=.001).

Conclusions: The study concluded that the coldmaneuver had a positive effect in reducing pain for intravenous cannulation.

Recommendations: The study recommended applying cold to patients during intravenous cannulation .

Keywords: cold, Pain, Intravenous Cannulation.

I. Introduction:

The global rates of cancer mortality and prevalence are rapidly increasing[(1)].According to estimates, there will be 609,820 cancer-related fatalities and 1,958,310 new cases of cancer in the United States by 2023[(2)]. The incidence of cancer in the Middle East has increased during the last ten years, especially in Iraq([(3)].Intravenous (IV) injections of antibiotics and chemotherapy are vital components of cancer treatment for patients, including those with solid tumors and blood malignancies[(4)]. One basic treatment that nurses often administer in chemotherapy units isIV,regardless of the size of the utilized cannula[(5)], there was no apparent reduction in pain

perception [6].Pain is the most frequently reported side effect associated with receiving a catheter, with over 50% of individuals in need of cannulation reporting feeling anxious and in pain. It can be argued that the pain and anxiety experienced by adult patients receive insufficient attention because the medication is administered so frequently[7] andit's a complex emotion that includes physical and mental components[8,9].
Compared to people with other medical illnesses, cancer patients usually experience higher levels of anxiety [3,10]. Nursesplay a vital part in controlling pain and lessening its intensity[11-15].The literature has provided evidence that a variety of pharmacological and non-pharmacological techniques can effectively reduce discomfort during peripheral intravenous (PIV) procedures. Non-pharmacological methods are not frequently used in Iraq to treat injection-related pain[11]. Non-pharmacological techniques that are simple to apply, economical, time-saving, and free of side effects are required to reduce discomfort during PIC ([16].Ice therapy is an inexpensive way to reduce pain. It works by blocking or stopping the transfer of pain signals. The most common approach used in clinics is using a cold pack composed of non-toxic Gel[17].The study was conducted as a clinical trial for individuals undergoing PIV cannulation. It aims to determine how cold affected patients' pain during IV cannulation.

II. Methods:

A true experimental design (a randomized controlled trial), was applied during peripheral venous insertion for cancer patients.it started from January to February 3, 2024, in Al-Haboubi Teaching Hospital's cancer department in Dhi-Qarcity. The sample was selected according to the following criteria(Patient with cancer in oncology center, Patient with age 18 to 70 years' old ,Patient having no communicational or mental handicaps).Exclusion Criteria (Patients with anticipated difficult intravenous access, known sensitivity to cold e.g., Raynaud's disease, sickle cell disease, patients who had any break or abrasion, infection or break in skin of area where ice would be applied, or nerve damage in the affected extremity, patient who had pre-existing pain e.g., peripheral neuropathy, chronic pain, fractures over the placement site, and no premedication analgesic and sedation were given, were topical or parenteral analgesics within 6 hours).

A sample of 102 patients receiving cannulation in an oncology facility was chosen using a basic random sampling technique. Sample study at (figure 1). Each of the two participants in the study is given a box containing four cards, two of which are numbered, which are the study participants, and two are unnumbered, which are those excluded from the study. After selecting the study participants, they are also given two white envelopes, inside each of which is a color indicating the study or control group. The red color is the control group, yellow color is for the control group.Two groups were randomly selected from among the 102 patients. The self-report and the VAS scale self-report used to follow the successful intravenous cannulation served as the data gathering tools.

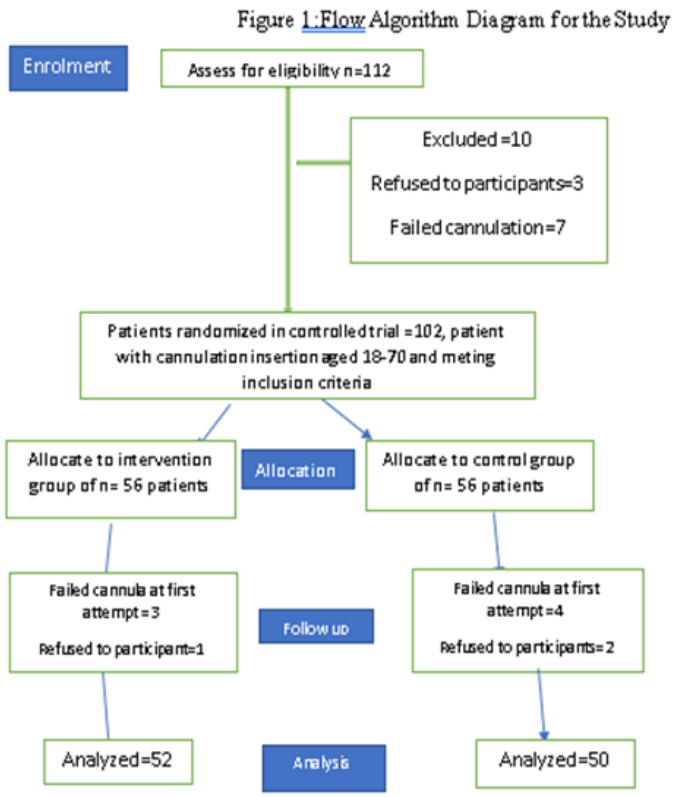

Figure 1: diagram of study sample

Visual Analogue Scale for Pain: Using a measurement method, the visual analog scale for pain is a commonly used tool for assessing the level of pain at any given time. According to the ICC, the VAS's reliability for measuring acute pain is high at 0.97. The VAS uses a 10-centimeter line to indicate the intensity of pain[19].

Intervention: Make sure the ice is frozen before applying. Before using the cannulation equipment, the patient's wrist was tourniquet. Following standard protocol, we located the proper vein on the dorsum hand and used an alcohol swab to disinfect the area around it. We then let it dry. After application, tape was utilized to keep the ice on the wrist. Ice was applied 3–5 cm proximal, or closer to the body, 30–60 seconds beforehand cannula placement, and it remained there the end of procedure. After the cannula was successfully inserted, the VAS was used to measure the degree of pain. The patient pointed to a location on the VAS line that described how they felt about their level of pain in the experimental and control groups. Control applied insertion without any interference, using stander care.

Clinical trial registration: IRCT ID 20230310057672N3 was the IRCT code assigned to the trial, which had been recorded in the Clinical Trial Register (75562). We adhered to all the rules established by the Declaration of Helsinki of the World Medical Association.

Ethical consideration: To obtain complete permission for inclusion in the current study, the researcher gave informed consent letters to all of the patients who participated in the oncology unit. They were also informed of their freedom to discontinue participation in the study at any point and to refuse to respond to any question at any point during the performance. The committee on ethics of Baghdad University's College of Nursing in Baghdad, Iraq, approved the study protocol (approval code: 22-11-2023).

Statistical analysis: We utilized SPSS26.0 for analyzing the information. The data were analyzed using both inferential and descriptive statistics (frequency, percentage, mean of score, standard deviation, and Mann-Whitney U test).

III. Results:

(Table 1): Significant Difference in Pain with regard to Application of Cold Maneuver among Patients with Cancer

Groups	Pain					
	M.	SD	Mann-Whitney U	Z-score	p-value	Sig.
Control	76.54	20.427	89.000	-7.730	.001	H.S
Experimental	28.76	20.491				

M: Mean, SD: Standard deviation, p: Probability, Sig.: Significance, HS: High Significant

This table depicts that application of cold maneuver is highly effective in relieving pain during cannulation insertion as indicated by high significant difference in lowering pain score with regard to experimental group at p-value= .001.

IV. Discussion:

The level of pain was reduced in experimental group when applied cold compared with control group at (Table1). The finding agrees some research, Mostafa et al.,reported that using an effective cold therapy can reduce pain during vaccinations[(20)].Meha conducted a study in Punjab with 60 adult patients undergoing IV catheterization. According to the study, applying ice to patients receiving IV significantly reduced their level of pain[(21)]. In India, 50 participants in all were randomized to the experimental group and the control group, according to Karale and Satve, the study discovered that ice is an accessible, reasonably priced method of pain relief and that the experimental group's pain levels decreased during venipuncture[(22)]. Ice application also applied in children in some studies and also showed the effective of pain relief in invasive procedures. Gaikwad et al.,conducting research on 60 children in total for two groups in India. According to the study's findings, treating children with ice is a feasible and effective strategy to lessen their pain during IV treatments [(23)]. Another study conducted by Bastami et al. in Iran,before the artery was punctured, the 31 individuals in the experimental group were given an ice pack, where the 30 in control group have no intervention. There was a statistically significant difference in the VAS pain scores between the two groups at ($p < 0.05$).A study asserted that applying a cold pack is an easy way to control pain prior to an arterial puncture[(24-26)]. The present study [(27, 28)]had limitations because the number of studied for applying cold in intravenous catheter in adult arelimited. We carried out this controlled trial study because it is critical to improve nursing practices and lessen patient discomfort, in addition to elevating the standard of nursing research because the nursing professions lack controlled trial research.

V. Conclusion

The present study found a positive effect of ice application in reducing pain in the experimental group rather than the control group, so the study recommended using the non-pharmacological method; ice is low cost and easy to use, and nursing staff were advised to use cold applied in intravenous cannulation.

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References:

[1] Al-Jubouri M, Isam S, Hussein S, Machuca-Contreras F. Recitation of quran and music to reduce chemotherapy-induced anxiety among adult patients with cancer: A clinical trial. Nursing Open. 2021;8(4):1606–14.

[2] Siegel RL, Miller KD, Wagle NS, Jemal A. Cancer statistics, 2023. Ca Cancer J Clin. 2023Jan12;73(1):17-48. https://doi.org/10.3322/caac.21763

[3] Al-Zaidy SK, Al-Fayyadh S. Efficacy of a pre-radiotherapy, nurse-led instructional program on anxiety level of patients receiving Radiotherapy (RT) for first time. OnkologiaiRadioterapia. 2023;17(9):370–8.

[4] Larsen EN, Marsh N, O'Brien C, Monteagle E, Friese C, Rickard CM. Inherent and modifiable risk factors for peripheral venous catheter failure during cancer treatment: a prospective cohort study. Supportive Care in Cancer. 2021 Mar; 29:1487-96.

[5] Schmidli J, Widmer MK, Basile C, de Donato G, Gallieni M, Gibbons CP, Haage P, Hamilton G, Hedin U, Kamper L, Lazarides MK. Editor's choice–vascular access: 2018 clinical practice guidelines of the European Society for Vascular Surgery (ESVS). European Journal of Vascular and Endovascular Surgery. 2018 Jun 1;55(6):757-818 .https://doi.org/10.1016/j.ejvs.2018.02.001

[6] van Loon FH, Puijn LA, van Aarle WH, Dierick-van Daele AT, Bouwman AR. Pain upon inserting a peripheral intravenous catheter: Size does not matter. The Journal of Vascular Access. 2018 May;19(3):258-65 .https://doi.org/10.1177/1129729817747531

[7] Welyczko N. Peripheral intravenous cannulation: reducing pain and local complications. British Journal of Nursing. 2020 Apr 23;29(8):S12-9 .https://doi.org/10.12968/bjon.2020.29.8.S12

[8] Abd-Alrazzaq A, Aziz A. Assessment of Mothers' Knowledge about Their Children with Sickle Cell Anemia and Non-Pharmacological Approaches to Pain Management in Basra Center for Hereditary Blood Diseases. Iraqi National Journal of Nursing Specialties. 2021;34(1):11–20.

[9] Ali NM, Kadhim AJ, Khachian A. Vibration and Exercise Maneuvers to Minimize Patients' Shoulder Pain Post laparoscopic cholecystectomy: A Randomized Clinical Trial. Iraqi National Journal of Nursing Specialties Journal. 2023;2(36):110–6.

[10] Khalaf G, Tawfieq N. Psychological Problems of Patients with Colorectal Cancer. Iraqi National Journal of Nursing Specialties [Internet]. 2013 Dec 30;26(3):40–6. Available from: https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/186

[11] Al-Jubouri M, Hussein A. Effect of Shotblocker on Venipuncture Pain among Blood Donors: A Randomized Controlled Trial. Bahrain Medical Bulletin [Internet]. 2024;46(1). Available from: https://www.researchgate.net/publication/379675464

[12] Majeed HM, Hassan AF, Jasim AH, Al-Ganmi AHA. Evaluation of Nurses' Practices and Perceived Barriers Related to Pain Assessment in Critically Ill Patients at Baghdad Teaching Hospitals. Azerbaijan Pharmaceutical and Pharmacotherapy J [Internet]. 2023 Jun 30;22(1):64–9. Available from: https://www.azpharmjournal.com/en/2023-vol-22-issue-1/evaluation-of-nurses-practices-and-perceived-barriers-related-to-pain-assessment-in-critically-ill-patients-at-baghdad-teaching-hospitals/

[13] Sabar D, Ahmed S. Association between Pain of Arteriovenous Fistula and Cryotherapy of Hemodialysis Patients. Migration Letters. 2023;20(S6):296–301.

[14] Ahjil Z, Maala E. Evaluation of nurses' knowledge toward pain management of leukemic child under chemotherapy. Iraqi National Journal of Nursing Specialties [Internet]. 2012 Nov 8;25(3):50–7. Available from: https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/143

[15] Al-Umair K, Al-Gersha K. Nurses Performance in Pain Management for Burn Patient at Baghdad City's General Hospitals. Iraqi National Journal of Nursing Specialties. 2005;18(1):97–108

[16] Yılmaz D, Güneş ÜY. The effect on pain of three different nonpharmacological methods in peripheral intravenous catheterisation in adults. Journal of clinical nursing. 2018 Mar;27(5-6):1073-80 . https://doi.org/10.1111/jocn.14133

[17] Faghihian R, Esmaeili M, Asadi H, Nikbakht MH, Shadmanfar F, Jafarzadeh M. The effect of external cold and vibration on infiltration-induced pain in children: a randomized clinical trial. International Journal of Dentistry. 2022 Sep 5;2022 .https://doi.org/10.1155/2022/7292595

[18] Shin J, Kim GS, Sim H. Comparing the effectiveness of three pain relief methods for inserting a needle into the implanted venous access chemoport: A randomized controlled trial. International Journal of Nursing Practice. 2022 Aug;28(4): e12974.https://doi.org/10.1111/ijn.12974

[19] Bijur PE, Silver W, Gallagher EJ. Reliability of the visual analog scale for measurement of acute pain. Academic emergency medicine. 2001 Dec;8(12):1153-7.

[20] Mostafa A, Attia A, Abd-Wahab A, Mohamed M, El-Sayed A. Effect of using Skin-Cooling Technique on Pain Relief during and after Immunization among Infants. SYLWAN. 2020 Dec;164.(12)

[21] Meha MS. A QUASI EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF ICE APPLICATION ON PAIN PERCEPTION OF PATIENTS UNDERGOING PERIPHERAL VENOUS CATHETERIZATION IN SELECTED HOSPITALS AT JALANDHAR, PUNJAB, 2019. Journal Homepage: http://ijmr. net. in. 2020 Oct;8(10).https://www.academia.edu/download/64988909/IJMSS3Oct20_8723.pdf

[22] Karale R, Satve S. The effectiveness of ice application on pain response prior to intravenous procedures among children.2015; 4(9): 101-106 https://www.thepharmajournal.com/archives/2015/vol4issue9/PartB/9-7-44-610.pdf

[23] .Gaikwad NS, Naregal PM, Mohite VR, Karale RB. A study to assess the effectiveness of ice application on pain response prior to intravenous procedures among children at tertiary care hospital. Asian journal of pharmaceutical research and health care. 2017 Dec 1:167-73

[24] Bastami M, Azadi A, Mayel M. The use of ice pack for pain associated with arterial punctures. Journal of clinical and diagnostic research: JCDR. 2015 Aug;9(8):JC07

[25] Ali, N. M., Kadhim, A. J., &Khachian, A. (2023). Vibration and Exercise Maneuvers to Minimize Patients' Shoulder Pain Post laparoscopic cholecystectomy: A Randomized Clinical Trial. *Iraqi National Journal of Nursing Specialties*, *36*(2), 110-116.

[26] Showaya, A. H., Kadhim, A. J., &Khachian, A. K. (2023). Application of Medication-Specific Social Support Scale on Patients with Type II Diabetes Mellitus. *Mosul Journal of Nursing*, *11*(2), 380-384.

[27] Ali, N. M., Kadhim, A. J., &Khachian, A. K. (2023). Comparison between Vibration and Standard Exercises on Shoulder Pain for Patients Post Laparoscopic Cholecystectomy: A Comparative Study. *Mosul Journal of Nursing*, *11*(2), 291-295.

[28] Kadhim, A. J., Mohammadi, N., Hezbiyan, Z., Abbasinia, M., Norouzadeh, R., Taghadosi, M., &Aghaie, B. (2024). The effects of a mindfulness training intervention on fatigue and job satisfaction among emergency nurses: A quasi-experimental study.