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Original Research Paper

Nursing

A STUDY TO ASSESS THE EFFECTIVENESS OF CRYOTHERAPY ON PAIN AND PHYSIOLOGICAL PARAMETERS AMONG PATIENTS DURING VENEPUNCTURE

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ABSTRACT

Cutaneous stimulation is an independent nursing intervention to minimize pain. Gate control theory clearly explains the effect of cutaneous stimulation. The purpose of the study was to assess the effectiveness of cryotherapy on large intestine energy meridian point (located between thumb and index finger), prior to venepuncture as a non-pharmacological intervention to reduce the pain and stabilize physiological parameters. A quasi experimental pre test post test control group design was used for the study, among 60 patients who had undergone venepuncture prior to cardiac catheterization. The samples were selected using convenient sampling technique. Demographic proforma, table to record physiological parameters and a standardized Numerical pain intensity scale were used as tool for data collection. The cryotherapy was given to experimental group and the control group received only routine care during venepuncture. The comparison on the effect of cryotherapy in reducing venepuncture pain between the experimental group and control group were done by 'z' test and the ANOVA was used to compare the pain score between the groups . The comparison of physiological parameters between the pre test and posttest scores were done by 't' test. The study results revealed that the experimental group experienced less pain than the control group. The results highlighted a positive correlation between pain and physiological parameters in experimental group. The study results concluded that cryotherapy at large intestine energy meridian point was effective in reducing venepuncture pain and stabilizing physiological parameters.

KEYWORDS : Cryotherapy, venepuncture, pain, physiologic parameters

INTRODUCTION

Pain is a sensory experience associated with actual or potential damage of tissue, with physiological and psychological responses. It is manifested in verbal, nonverbal behaviors and alterations in physiological responses like pulse rate, respiratory rate, blood pressure, emotional and spiritual reactions. Inadequate treatment of pain is widespread throughout surgical wards, intensive care units, accident and emergency departments, and in general practice. Research studies have highlighted the fact that cryotherapy is equally effective and important in alleviating or minimizing pain as a cutaneous stimulation technique. The large intestine energy meridian is a point located on the backside of the hand between index finger and the thumb. The large intestine energy meridian pathway is bilateral. Considering the anxiety due to painful procedures such as venepuncture, as well as the unpleasant feelings, the investigator felt that application of cryotherapy to the skin would decrease the pain-related responses associated with venepuncture. This study was therefore undertaken to assess the effect of cryotherapy on the large intestine energy meridian point (li4), during venepuncture to reduce the perception of pain and variation in physiological responses like pulse rate, respiratory rate and blood pressure.

OBJECTIVES

1. To assess the physiological parameters before venepuncture for both experimental group and control group.
2. To provide cryotherapy for the experimental group.
3. To assess the pain and reassess the physiological parameters after venepuncture in experimental group and control group.
4. To compare the effectiveness of cryotherapy in experimental group with control group.

OPERATIONAL DEFINITIONS

Effectiveness: It refers to the consequence of cryotherapy in terms of reduction in pain, and variation in pulse rate, respiratory rate, blood pressure in patients undergoing venepuncture.

Cryotherapy: It is the procedure of applying ice cubes wrapped in gloves, in the large intestine energy meridian point, that is in the web between the index finger and thumb of the ipsilateral hand (same hand of venepuncture) or contralateral (opposite hand of venepuncture), to slow the pain impulse transmission.

Pain: It is an unpleasant subjective experience of the patient during venepuncture.

Physiological Parameters: It refers to the vital signs like pulse rate, respiratory rate and blood pressure of patients undergoing venepuncture.

Patients: It refers to the subjects undergoing venepuncture, prior to cardiac catheterization and who satisfies the inclusion criteria ,in K.G Hospital, Coimbatore.

Venepuncture: It is a procedure of inserting cannula into the vein for introduction of drugs, fluids and for collecting blood.

MATERIAL AND METHODS

Quantitative approach with quasi experimental pre test post test control group design was used for the study. The research has two experimental group and one control group. In this study the experimental group I represents the contralateral group (the cryotherapy is given on the opposite hand of venepuncture). The experimental group II represents the ipsilateral group (cryotherapy is given on the same hand of venepuncture). Convenient sampling technique was used to select 60 subjects who undergone venepuncture. Demographic proforma, table to record physiological parameters and a standardized Numerical pain intensity scale were used as tool for data collection. The cryotherapy was given to experimental groups, where as in the control group only routine care was given during venepuncture.

RESULTS

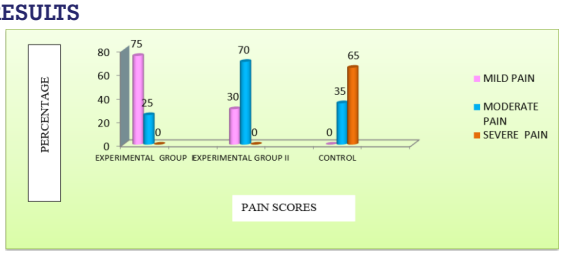

FIGURE1: Diagram Showing Distribution Of Post Test

Pain Scores In Experimental Groups And Control Group

Regarding pain intensity, in Experimental group I 15 (75%) had mild pain and 5 (25%) had moderate pain. In Experimental group II 6 (30%) had mild pain and 14 (70%) had moderate pain. In control group 7 (35%) had moderate pain and 13 (65%) had severe pain. This conclude that cryotherapy in the large intestine energy meridian point is effective in reducing venepuncture pain in both experimental groups. Among the groups the cryotherapy is found to be more effective in experimental group I.

Table 1: Anova-comparison Of Pain Score Between The Groups n=60

Source	Df	SS	MSS	F	F table
Between groups	2	214.3	107.15	39.25	19.45
Error	57	155.7	2.73		
Total	59	370	-		

df-degree of freedom, SS-sum of square, MSS-Mean sum of square

The above ANOVA table shows the comparison of pain scores between the three groups. The calculated value of ' F' is greater than the tabulated value of 'F' at 5% level. So the null hypothesis is rejected. Hence, there is a significant difference in the post test pain scores between the three groups. This shows that cryotherapy at large intestine energy meridian point is effective in reducing venepuncture pain.

Table 2: Comparison Of Pain Score Between Experimental Groups And Control Group N=20

Groups	Mean	SD	Calculated value of 'z'
Experimental group I Control	2.4 6.95	1.14 0.9	13 *
Experimental group II Control	4.2 6.95	1.2 0.9	7.9 *
Experimental group I Experimental group II	2.4 4.2	1.14 1.2	4.46 *

* = Significant

DISCUSSION

The mean pain score of experimental group I is 2.4 , the mean pain score in the experimental group II is 4.2 and the mean pain score in the control group is 6.95. It reveals that cryotherapy in the experimental group I is more effective than other two groups. The present study is supported by the findings of a similar study conducted by Richman P.B (2000) conducted to assess the effectiveness of ice in reducing the pain of intravenous catheter placement, in 28 adult volunteers. An ice pack was placed over one arm for 10 minutes, followed by insertion of an 18-gauge angio catheter in both arms. Patients recorded their pain assessment after each venepuncture on a previously validated 100-mm visual analog scale. Results revealed that application of ice pack was an effective method in reducing pain of intravenous catheter placement.

Paired 't' test was used to assess the effectiveness of cryotherapy on physiological parameters.. The results reveals no significant difference in the physiological parameters within the experimental groups. But within the control group the test result reveals a significant difference in physiological parameters, before and after the intervention. This shows cryotherapy is effective in stabilizing the physiological parameters. The study results shows that there is a positive correlation between pain and physiological parameters in experimental groups. The present study is supported by the findings of a similar study conducted by Sylvia M. Kubsch, to assess the effectiveness of cutaneous stimulation on pulse rate and blood pressure among 50 patients in emergency department. Cryotherapy was given as a cutaneous stimulation to reduce procedural pain. Following cryotherapy subjects reported significantly reduced pain and less variation in pulse rate and blood pressure readings.

RECOMMENDATIONS

The study recommends the following for further research

- A comparative study can be undertaken to compare the effectiveness of cryotherapy with other complimentary therapies.
- A similar study can be conducted using true experimental research design.
- A similar study can be performed to assess the effectiveness of cryotherapy to reduce pain in other invasive procedures like injections, blood collection.

CONCLUSION

The study results revealed that the experimental groups experienced less pain than the control group during venepuncture. Among both experimental groups cryotherapy on experimental group I found to be more effective. The study results concluded that cryotherapy at large intestine energy meridian point was effective in reducing venepuncture pain and stabilizing physiological parameters. Nurses can adopt cryotherapy as a simple nursing intervention to reduce venepuncture pain and promote well being during peripheral cannulation.

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