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EFFECTIVENESS OF VALSALVA MANEUVER ON PAIN PERCEPTION AMONG PATIENTS UNDERGOING INTRAVENOUS CANNULATION IN INDIRA GANDHI MEDICAL COLLEGE AND HOSPITAL SHIMLA, HIMACHAL PRADESH

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ABSTRACT

Background: Intravenous cannulation is most common invasive procedure, used in the healthcare setting for drug administration which causes pain and distress to the recipient. Past experiences about intravenous cannulation may leads to avoidance or postpone needed medical care. Valsava maneuver is a most effective non-pharmacological and non-invasive procedure which is used to reduce the pain of the patient during intravenous cannulation.

Aim: A quasi-experimental study was conducted to evaluate the effectiveness of Valsalva maneuver on pain perception among patients undergoing intravenous cannulation in Indira Gandhi Government Medical College and Hospital Shimla, Himachal Pradesh.

Methodology: A quasi experimental with post-test only control group design was used to conduct the present study. Purposive sampling technique was used to select the sample size of 50 adult patients who were between the age group of 21-60 years admitted in medical ward, surgical ward, and oncology unit those are undergoing for intravenous cannulation at Indira Gandhi Medical College and Hospital Shimla, Himachal Pradesh. The tools of study were demographic variables and numerical pain rating scale.

Result: Data analysis was done by descriptive and inferential statistics. In experimental group majority of study subjects 80% had mild pain whereas in control group majority of study subjects 72% had moderate pain. Mean pain score and standard deviation of experimental group as 2.56±1.227 and of control group as 4.56±1.294.The calculated t value as 5.608 at significance level of ≤ 0.05 and df (48) hence the calculated t value is greater than the tabulated 't' value which indicates that intervention was effective in experimental group. The above findings shows that the intervention was effective in experimental group. There was no significant association of post-test pain score with any of the selected associated variables in the experimental and control group.

Conclusion: The study concludes that the Valsalva maneuver is non-invasive, non-pharmacological and effective method to reduce pain associated with intravenous cannulation.

Keywords:- Pain, Intravenous cannulation, Valsalva maneuver

INTRODUCTION

Pain is an uncomfortable phenomenon. It is one of the factors which interfere with the quality of life of the people.[1] Pain is derived from Greek word poine, which means penalty or punishment.[2] According to The International Association of Study, "Pain is an unpleasant sensory and emotional experience associated with actual and potential tissue damage".[3]

In a hospital setting, patients experience pain because of different causes. In this regard, the American Pain Society classifies pain as the fifth vital sign which emphasizes the importance of pain and increases the awareness of health-care professionals about its control. Millions of people worldwide suffer from pain without adequate treatment every year. One of the main reasons is diagnostic-therapeutic procedures.[4]

The exposure to noxious stimuli like pain results in the release of neuro transmitters which may surround pain fibers, causing inflammatory responses. The pain fibers enter the spinal cord and travel one of several routes until ending with in the gray matter of the spinal cord. There by transmitting the pain. Nerve

impulses resulting from painful stimulus travels along afferent and efferent peripheral nerve fibers.

Peripheral intra venous cannulation is one of the most commonly performed invasive clinical procedures in the hospitalized patients. Most clients are fearful of intravenous cannulation pain. Past experiences about intravenous cannulation may leads to avoidance or postpone needed medical care.

The anticipation of pain about intravenous cannulation is generally under estimated and unappreciated. During intravenous cannulation patients may experience moderate to severe pain.[5]

Nonpharmacological interventions include nursing activities that can relieve pain. Such interventions are effective, simple, and safe and do not require specific time and costly equipment.

Valsalva maneuver is a non-invasive, non-pharmacological and effective method to reduce pain associated with peripheral intravenous cannulation. It is one of the less expensive, easily performed method.

This technique is named for Antonio Maria Valsalva, the 17th Century physician and anatomist. The Valsalva maneuver is performed by moderately forceful attemped exhalation against closed airway. It can be performed by straining or coughing. Blowing forcefully in to rubber tubing connected to aneroid BP apparatus and raising the needle of the dial up to 20 points for a period of 20 seconds can also induce this maneuver.[6]

During Valsalva maneuver contraction of thoracic cage compresses lung and causes increase in intrathoracic pressure resulting in compression of vessels within the chest and in turn stimulates vagus nerve and vagus nerve in turn activates the bar receptor. The activation of either the cardio pulmonary bar receptor reflux or sin aortic bar receptor reflux induces antinociception. Through Valsalva bar receptors activates and control activity of sympathetic system and reduce pain.[7]

In conclusion, it is found that intravenous cannulation is most common procedure, used in the healthcare setting which causes pain and distress to the recipient.

Various studies conclude that Valsalva maneuver helps in reduction of pain during intravenous cannulation.

OBJECTIVES

1. To assess the level of pain during intravenous cannulation among patient in experimental group and control group.
2. To compare the effectiveness of Valsalva maneuver on pain perception among patients undergoing intravenous cannulation between experimental and control group.
3. To find out association of the level of pain during intravenous cannulation among patient in experimental and control group with selected demographical variables.

METHODOLOGY

A quantitative research approach and quasi-experimental research design was used. Data was collected from Indira Gandhi Medical College and Hospital Shimla Himachal Pradesh. 50 adult patients between the age of 21-60 years, admitted in medical ward, surgical ward, and oncology unit those were undergoing for intravenous cannulation selected by using purposive sampling technique. 30 study subjects were selected in experimental group and 30 in control group.

The data collection tool used for the study was demographic variables and numerical pain rating scale. The demographic variables were age, gender, education, activity level, residence and previous experience of intravenous cannulation. 10 point numerical pain rating scale was used to assess the level of pain during intravenous cannulation. The content validity of the tool was established after the consultation with experts in nursing and medical fields. Reliability was not sort as the tool i.e. standardized one.

The study was conducted after obtaining the formal permission from the authorities, the purpose of the study was explained and informed consent was obtained. Confidentiality was assured to all the samples.

In experimental group, demographic data of subjects was taken by interview schedule. Supine position was given to experimental group and intervention was

given to subjects by instructing them to blow forcefully into the rubber tubing connected to aneroid BP apparatus and raising the needle of the dial up to 20 mm hg for a period of 20 seconds. Twenty seconds laters, intravenous cannulation was performed with 20 G intravenous cannula, after cannulation with the help of numerical pain rating scale the client was asked to notify the level of pain form score 1-10.

In control group, demographic data of the subjects was taken similarly by interview schedule. Supine position was given to control group and after applying tourniquet, cannula was inserted and immediately after cannulation with the help of numerical pain rating scale the client was asked to notify the level of pain from score 1-10. Numerical pain rating scale was used to evaluate the effectiveness of Valsalva maneuver on pain perception among patients undergone for intravenous cannulation.

Data was analysed by descriptive and inferential statistics i.e. frequency, percentage, mean, mean percentage, standard deviation, unpaired "t" test and chi square to determine the association between level of pain during intravenous cannulation with selected variables.

RESULT

The collected data was analysed by using descriptive statistics and the study findings are organized under following sections.

SECTION-A: Finding related to distribution of socio-demographic variables in term of frequency and percentage.

In experimental group majority of the study subjects 14(56%) were in the age group of >50-60 years, 13 (52%) were male, 13 (52%) were Primary/ Middle, 16 (64%) were sedentary workers, 21 (84%) were from rural area and 10 (40%) had previous experience of intravenous cannulation twicely.

In control group majority of study subject 11(44%) were also in the age group of >50-60 years, 13(52%) were female, 13(52%) were Primary/ Middle, 18(72%) were sedentary worker, 19(76%) were also from rural area and 8(32%) had previous experience of intravenous cannulation more than three times.

SECTION-B: Findings related to level of pain score during intravenous cannulation among patients in experimental group and control group.

In experimental group majority of study subject 20(80%) had mild pain whereas in control group majority of study subject 18(72%) had moderate pain.

Table 1

Frequency and Percentage of Post Numerical Pain Rating Scale (NPRS) Score in Experimental Group and Control Group.

N=50

MEASURING CRITERIA FOR POST NPRS SCORE		
CATEGORY SCORE	**EXPERIMENTAL POST NPRS (n_1 = 25) (f)%**	**CONTROL POST NPRS (n_2 = 25) (f)%**
SEVERE PAIN (7-10)	0(0%)	2(8%)
MODERATE PAIN (4-6)	5(20%)	18(72%)
MILD PAIN (1-3)	20(80%)	5(20%)
NO PAIN (0)	0(0%)	0(0%)

Maximum Score = 0
Minimum Score = 10

Table 1 depict in experimental group majority of study subject 20(80%) had mild pain followed by 5(20%) had moderate pain, 0(0%) had severe pain, 0(0%) had no pain whereas in control group majority of study subject 18(72%) had moderate pain followed by 5(20%) had mild pain, 2(8%) had severe pain, 0(0%) had no pain. Hence, it was found that maximum study subjects from experimental group 20(80%) had mild pain and in control group maximum study subjects 18(72%) had moderate pain.

SECTION-C: Finding related to comparison of post-test pain scores between experimental group and control group.

Table 2

Comparison Between the Group with Unpaired 't' Test regarding Effectiveness of Valsalva Maneuver on Pain Perception During Intravenous Cannulation. N=50

Unpaired t Test		N	Mean Score	Mean %	S.D.	MD	Unpaired Test	df	P Value	Table Value at 0.05
POST NPRS Score	EXPERIMENTAL GROUP	25	2.56	25.60	1.227	2	5.608*	48	<0.001*	2.011
	CONTROL GROUP	25	4.56	45.60	1.294					

Maximum Score=0
Minimum Score=10
***Significant at ≤ 0.05 Level of Significance**

Table 2 shows the mean pain score and standard deviation of experimental group as 2.56±1.227 and of control group as 4.56±1.294. The mean difference of intravenous cannulation pain score of experimental group and control group was 2. This indicates that the mean pain score of experimental group was lower than the mean pain score of control group. The calculated t value as 5.608 at significance level of ≤ 0.05 and df (48) . Hence, the calculated t value is greater than the tabulated 't' value which indicates that intervention was effective in experimental group.

SECTION-D: Finding related to association of level of pain during intravenous cannulation among patient in experimental and control group with selected demographical variables.

Chi-square test used to associate the level of intravenous cannulation pain and demographic variables such as age, gender, education, activity level, residence, previous experience of intravenous cannulation. There was no significant association between the level of pain score and selected demographic variables in both groups.

CONCLUSION

On the basis of findings of the present study, the following results were drawn:

Intravenous cannulation is one of the most common invasive clinical procedure done in the hospitals for drug administration and because of patients anxiety and fear concerning pain of needles may prevent them from seeking health care. In experimental group majority of study subjects had mild pain whereas in control group majority of study subjects had moderate pain. Valsalva maneuver is less expensive, safe, non-invasive, non-pharmacological and effective method. It was found to be an effective nursing intervention in reducing pain perception among adult patients during intravenous cannulation. There was no significant association between the level of pain score and demographic variable such as age, gender, education, activity level, residence, previous experience of intravenous cannulation.

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