A Study to Assess The Effectiveness of Slow Deep Breathing Exercise As An Adjuvant To Opioid For Pain During First Chest Tube Removal Among Patients Undergoing Sternotomy In GKNM Hospital, Coimbatore

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ABSTRACT:

An interventional study was conducted to "Assess the Effectiveness of Slow Deep Breathing Exercise as an Adjuvant to Opioid for Pain during First Chest Tube Removal among Patients Undergoing Sternotomy in GKNM Hospital, Coimbatore". The main objective of the study is to assess the level of pain during chest tube removal of patients in control group and experimental group. The research design is "True Experimental Post-test only control group design". Cardio-Thoracic Intensive Care Unit of G. Kuppuswamy Naidu Memorial Hospital, Coimbatore is the setting of this study. 60 hospitalized patients with post sternotomy having mediastinal and pleural chest tube were selected as samples. 30 patients were assigned each in experimental and control group. Simple random sampling technique was used for this study. The experimental group was taught slow deep breathing exercise pre-operatively and practiced it both preoperatively and post operatively and it was reinforced by providing a pamphlet regarding the various steps of slow deep breathing exercise. The experimental group received opioids according to the hospital protocol and in addition they practiced slow deep breathing exercise 5 minutes prior to chest tube removal. The control group received only opioids (inj. Morphine 3mg, IV). The pain during first chest tube removal was assessed using behavioural pain rating scale and the physiological parameters recorded from the cardiac monitor. The calculated 't' value for difference of the means was 5.20 is higher than the table value (2.00). It shows that there was significant difference between mean values of experimental and control group. Therefore, the H1 was accepted. Sex (χ=7.28) was significantly associated with the level of pain during chest tube removal at 0.05 level. The finding of the study revealed that patients receiving opioids along with slow deep breathing exercise will have better pain control than the patient receiving only opioid during the first chest tube removal.

Key Words: Deep Breathing Exercise; Opioid; Pain; Chest tube: Sternotomy.

INTRODUCTION:

Pain is a red signal, telling us there is a problem somewhere in the body that needs fixing. In fact, it is such an indicator of health. Pain assessment is called the fifth vital sign joining temperature, pulse, respiration and blood pressure. It is one of the symptom or complaint that causes people to seek health care and always manifests a pathologic process. Pain is a subjective experience which can be understood by others only by the verbal expression of the person experiencing the pain. It is also manifested by behavioural and physiological responses (Potter, P., & Perry, A.G, 2006). Pain accompanying surgery is one of the examples of acute pain but poorly understood and not well managed. Pain results when nociceptors (nerve endings) are stimulated by mechanical, thermal, or chemical factors. Nociceptive stimuli are those that have the potential to cause damage. The impulse is transmitted from the nociceptors to the spinal cord through the dorsal horn which sends the pain message to the brain stem and thalamus. Thus, the person feels the pain by the efferent nerves. (Kozier., & Erbs., et al., 2004).

NEED FOR THE STUDY:

In 2006 researchers at Wright State University in Dayton, Ohio, conducted a small pain management study in which they compared the value of using deep-breathing relaxation exercises together with pain-relieving drugs versus using drugs alone, members of the deep-breathing group reported significantly lower pain ratings during the 15-minute period after the procedure (Friesner Stacy, 2006). The removal of a chest drain is a painful and frightening experience for the patient. However, there is limited research regarding the amount of pain experienced or effectiveness of analgesia and non-pharmacological interventions for this procedure. Thus, the purpose of this study was to determine whether relaxation exercises added to standard medical therapy would result in improved pain-management outcomes (Bruce, E.A., et al., 2006). So, researcher felt that there is needed to reduce the distressful experience among the patient provoked group and this promoted the researcher to conduct the study.

METHODS:

In this study quantitative research approach was selected for assessing the effectiveness of slow deep breathing exercise in pain relief during the chest tube removal. True Experimental, Post-test only control group design was selected for this study. The population of the study comprised of all patients who were having chest tube drainage following sternotomy. The sample size consisted of 60 hospitalized patients with post sternotomy having mediastinal and pleural chest tube. 30 patients were assigned each in experimental and control group. Simple random sampling technique was adopted for the study. Patients were randomly assigned to experimental and control group.

MATERIALS:

The data were collected for four weeks in CTICU. Sample selected were given self -introduction and an oral consent was obtained. The participants were assured about the confidentiality of the data collected and that it will be used only for research purpose. Slow deep breathing exercise was explained pre-operatively and it was reinforced by providing a pamphlet regarding the various steps of slow deep breathing exercise. The demographic data like age, sex, religion, educational status, occupation, monthly Income, marital status and about previous surgical experience, details about the present surgery, chest tube placement and removal were collected by using structured interview schedule and the pain during chest tube removal was assessed using behavioral pain rating scale. Physiological parameters such as pulse rate and mean arterial BP 1 min before, during and after the first chest tube removal were monitored by using check list. Behavioral pain assessment scale was used to evaluate the pain experience during first chest tube removal. It includes five measurement categories such as Face, Restlessness, Muscle tone, Vocalization and Consolability. · The score for the five measurement categories are 0, 1 and 2. Document the total pain score out of 10. The level of pain during chest tube removal interpreted as: 0- No pain 1-3 Mild pain 4 - 6 Moderate Pain 7 -10 - Severe Pain

DATA ANALYSIS:

Descriptive and Inferential statistics were used to analyze the data · Frequency and percentage distribution to assess the demographic variables. t-test for two means were used to compare the pain experience during chest tube removal among experimental and control group. Chi-square test was used to assess the association between pain and demographic variables.

RESULTS:

TABLE 1: COMPARISON OF PAIN EXPERIENCE IN EXPERIMENTAL AND CONTROL GROUP

n= 60

Group	Mean	Mean difference	Combined SD	't'-value	Df	Table value
Control group	4.6					
Experimental group	2.5	1.9	1.41	5.20[*]	58	2.00

[*]Significant at 0.05

Table 1 shows that the calculated 't' value (5.20) is higher than the table value (2.00) with the degrees of freedom 58. Therefore, there is a significant difference in pain experience between the patients who are receiving opioid along with slow deep breathing exercise and patients who receive only opioids. So, H1 is accepted.

TABLE - 2: ASSOCIATION OF DEMOGRAPHIC VARIABLES WITH THE LEVEL OF PAIN DURING CHEST TUBE REMOVAL

n=30

S. No	Demographic variables	Level of pain				Chi squire value	Table value	Level of signif-icance
		No pain	Mild pain	Moderate pain	Severe pain			
	Age					χ=9.74 df=8	15.51	NS
1	≤ 40	0	1	1	0			
2	41-50	0	1	0	0			
3	51-60	0	1	7	1			
4	61-70	0	2	14	0			
5	≥ 71	0	0	2	0			
	Sex					χ=7.28 df=2	5.99	S
1	Male	0	5	21	0			
2	Female	0	0	3	1			
	Religion					χ=5.79 df=4	9.49	NS
1	Hindu	0	4	21	1			
2	Muslim	0	1	0	0			
3	Christian	0	0	3	0			
	Education					χ=7 df=6	12.59	NS
1	Illiterate	0	0	4	0			
2	School Level	0	2	15	1			
3	Undergraduate	0	3	3	0			
4	Postgraduate	0	0	2	0			
	Marital Status					χ=5.17 df=2	5.99	NS
1	Married	0	1	0	0			
2	Unmarried	0	4	24	1			
	Past history of any surgery					χ=2.85 df=2	5.99	NS
1	Yes	0	1	13	0			
2	No	0	4	11	1			
	Present surgery							

1	CABG	0	4	19	1	$\chi=0.26$ df=2	5.99	NS
2	Valve Replacement	0	1	5	0			
	Number of chest tubes insitu							
1	2	0	4	11	0	$\chi=2.97$ df=2	5.99	NS
2	3	0	1	13	1			
	Placement of the chest tube							
1	Lt. Mediastinal	0	2	11	0	$\chi=2.97$ df=4	9.49	NS
2	Rt. Mediastinal	0	2	5	0			
3	Pleural	0	1	8	1			
	Day of removal					$\chi=0.54$ df=2	5.99	NS
1	3rd	0	5	22	1			
2	4th	0	0	2	0			

Note: χ - chi-square value   df – degree of freedom

Level of significance: 0.05 NS – Non significant   S – Significant

Table 2 shows association of demographic data with the level of pain during chest tube removal among experimental group. It reveals that age, religion, education, occupation, monthly income, past history of any surgery, present surgery, number of chest tube in situ, placement of chest tube and day of removal were not significant at 0.05 level so it has no association with the level of pain experienced during chest tube removal, whereas sex, ($\chi=7.28$ at df = 2) was significant at 0.05 level so it has an association with the level of pain experienced during chest tube removal.

DISCUSSION:

Miller., and Perry (2008) tested the effects of a relaxation technique, slow deep breathing on the postoperative pain of 15 coronary artery by-pass graft (CABG) patients. Significant decreases were demonstrated in blood pressure, heart rate, respiratory rate and pain ratings. The present study findings in the experimental group, 2(67.67%) patients had no pain, 21(70%) had mild pain, 6(20%) patients had moderate pain and only 1(3.33%) had severe pain during chest tube removal. The mean pain score of the experimental group was 2.53 with a standard deviation of 1.52. The calculated 't' value (5.20) is higher than the table value (2.00) with the degrees of freedom 58. It indicates there is a significant difference in pain experienced between the patients who received opioid along with slow deep breathing exercise and patients who received only opioids. Sex, ($\chi=7.28$ at df = 2) was significant at 0.05 level so it has an association with the level of pain experienced during chest tube removal whereas other demographic data were not significant.

CONCLUSION

The findings of the study proved that the effectiveness of slow deep breathing exercise as an adjuvant to opioid for pain during first chest tube removal among patients undergoing sternotomy. Considering the study findings, teaching slow deep breathing

exercise preoperatively, practicing slow deep breathing exercise in both pre- and post- operative periods and performing slow deep breathing exercise 5 min prior to chest tube removal can be routinely adopted in the hospital so that it may reduce the bitter pain experience during chest tube removal.

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