

Anterior Chest Physiotherapy and Breathing Exercises for Cardiac Surgery Patients; A Cross Sectional Survey

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A B S T R A C T

Background: Coronary artery disease introduced as the most prevalent cause of mortality all over the world. There is limited published data on which type of chest physiotherapy and breathing exercises are recommended to cardiac patients after surgery.

Objectives: To determine the prevalence of chest physiotherapy and breathing exercise for the post cardiac patients.

To determine the type of chest physiotherapy and breathing exercise for the post cardiac patients.

Methodology: A Cross-sectional survey was conducted on 150 physiotherapists from March to August 2018 selected via convenience sampling technique. Data was collected from Tabbah cardiac Hospital and NICVD Karachi, using self-structured questionnaire for prevalence and type of exercise. Data was analyzed using SPSS v.21.

Results: According to the results, the prevalence of chest physiotherapy and breathing exercise for the cardiac patients was 80%. The most frequent type of exercise was deep breathing 92%, diaphragmatic breathing 90%, coughing 80%, relaxation techniques 72% and chest wall Vibration 70%. The less used treatments were positive expiratory pressure (PEP) device breathing (21.3%) and inspiratory resistance positive expiratory pressure (IR-PEP) (12.5%). Recommendations to continue breathing exercises after discharge varied from not at all up to 3 months after surgery.

Conclusion: Physiotherapy and Breathing exercise are mostly used in post-operative cardiac procedures. Every Hour breathing activities, diaphragmatic breathing and pressed together lip breathing exercise the highly recommended regime practiced. Guideline for the duration after discharge varies.

Introduction

Coronary artery diseases (CAD) presented as the most common reason for mortality everywhere

throughout the world.¹ There is high rate of aspiratory complexities after such heart medical procedures and the

most widely recognized pneumonic impedance accounted are for as atelectasis, pleural effusion and phrenic nerve loss of motion.² A few traditional procedures have been proposed to control or improve aspiratory work during postoperative period like stance waste, chest divider vibration, chest physiotherapy, active cycle of breathing techniques (ACBTs), dynamic developments of furthest points and early ambulation.³ Chest physiotherapy is an airway clearance techniques (ACTs) to deplete the lungs, and may incorporate percussion (clapping), vibration, breathing, and huffing or hacking.¹⁵ Chest physiotherapy and breathing activities assume its job to keep from the postoperative pulmonary complications (PPCs).

Westerdahl and Olsen in (2015) led a study on chest physiotherapy after cardiovascular medical procedure and expressed that diverse chest physiotherapy methodologies recommended are after heart medical procedure around the world. They presumed that breathing activities are normally recommended during the underlying postoperative days. Hourly profound breathing activities are performed with or without PEP (positive expiratory pressure) gadgets.⁵ An investigation by Patrick Pasquina et al led in Switzerland expressed value of physiotherapy for the aversion of aspiratory complexities after cardiovascular medical procedure is demonstrated with no particular exercise suggestion.⁶ An examination shows Preoperative inspiratory muscle preparing decreased the frequency of pneumonic entanglement and span of postoperative hospitalization in patients at high danger of building up an aspiratory intricacy experiencing CABG medical procedure⁷, shows the significance of physiotherapy pre operatively. Lomi C et al in 2013 expressed that Deep breathing activities and motivator spirometry were the two most as often as possible utilized systems. Sternal precautionary measures were given routinely, however the exhortation given fluctuated with respect to what extent after medical procedure the patients ought to evade weight bearing ⁸ Westerdahl et al in 2010 finished up All respondents thought about physiotherapy fundamental after cardiovascular medical procedure, yet just 50% of them considered the physiotherapy treatment offered as ideal. The recurrence and term of activities and proposals for sternal precautions strengthened for the mending time frame contrast between physiotherapists.⁹

The chief motivation behind this research is to find the kind of chest physiotherapy and breathing activity for heart medical procedure patients used via cardiovascular physiotherapist. The physiotherapy use after heart medical procedure is since long time yet uniformed physical therapy practices are not prescribed which be applied on cardiovascular patients, each Hospital have its very own set criteria for post-medical procedure heart understanding. It is critical to think about standard physiotherapy regime which physiotherapists should practice after heart medical procedure.

Methodology

A cross-sectional survey design is used in this study. After the approval of synopsis, the overall duration of data collection was 6 months. Total 80 physiotherapists who were working in cardiothoracic unit of different hospitals included in this research. Non probability purposive sampling was used for the data collection. The calculated sample size was 150 physiotherapists which were calculated through the following formula for sample size calculation for cross sectional surveys.¹⁰ A Cross-sectional survey was conducted on 150 physiotherapists from March to August 2018 selected via convenience sampling technique. Data was collected from Tabbā cardiac Hospital and NICVD Karachi. Those physiotherapists who treat patients of cardiac surgery (CABG, mitral, aortic or tricuspid valve surgery including off pump surgery) and having experience more than one year were included. While those Physiotherapists who had experience less than one year and treats patient with neurological symptoms, circulatory instability were excluded from the study. The questionnaire we used was developed by Tom over-end Associate professor. university of western Ontario, Toronto Canada in 2009 this questionnaire was specially designed for post cardiac physical therapy related questions by reviewing the literature and previously used questionnaire¹²⁻¹³ The purpose of this questionnaire was to determine current physiotherapy practice regarding breathing exercises in cardiac surgery patients. After the approval from IRB (Institutional review board) the process of data collection was started and physiotherapist was approached from different hospitals. Consent form was given to the participants and those who signed their consent and met the inclusion criteria were included in research. The

questionnaire was self-distributed among the participants and explained by the researcher. SPSS 21 was used to calculate and evaluate the numerical data. Keeping the privacy of patient intact was of utmost importance. No harm was caused to any person during the research.

Results

In the results, out of 150 physiotherapists 78%(n=117) were males and 32 %(n=48) were females shown in figure 01.

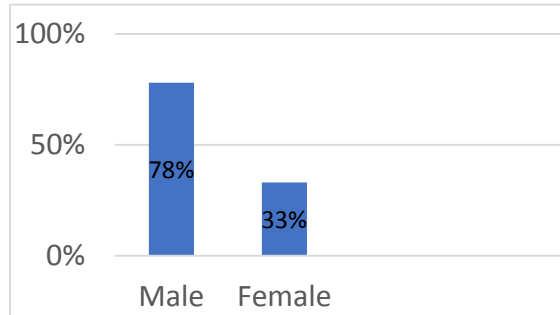


Figure 1. Percentage of Male and Female participants

The mean experience of physiotherapist, who was appointed at the department of cardiothoracic surgery, was 6 years with the mean age 32 years. Chest physiotherapy treatment was routinely recommended to the patients at cardiothoracic intensive care unit (ICU). During first post-operative day physiotherapists who had experience of working in the ICU, recommend physiotherapy on day 1 were 80% (n=120) and physiotherapist who recommended physiotherapy for selective patient are 16.3% (n=25) while only 3.8% (n=5) physiotherapists didn't recommend physiotherapy at day 1. Figure 2

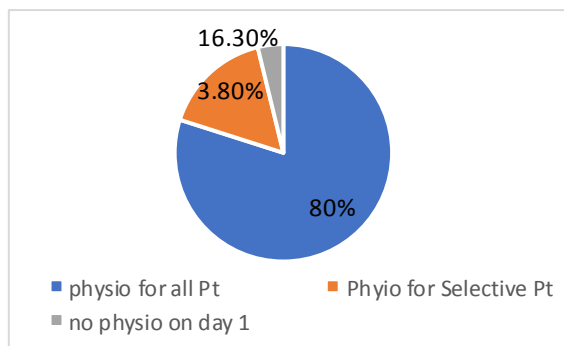


Figure 2. Recommendation for physiotherapy post-surgery

Usual chest physiotherapy treatments given to cardiac surgery patients during the first two post-operative days are breathing exercise, coughing, relaxation

techniques, chest wall vibration/percussion and postural drainage. 94% (141) physiotherapist chooses breathing exercise on first post-surgery and 87% (130) prefer it on 2nd day too. 78% (117) and 77% (115) perform coughing and relaxation exercise respectively, (Table I). Type of breathing exercise use first post-operative days are deep lip breathing exercise 98%, diagrammatic breathing 80%, pursed lip breathing 79%, sustain maximal 30%, incentive spirometry 22%. (Figure 03) Top Five chest physiotherapy exercise and breathing exercises given to cardiac surgery patients during the initial post-operative days are deep breathing exercise by 48% physiotherapist, diagrammatic breathing 31% mostly per hour. Pursed lip breathing 27% and coughing 32%, is suggested three times a day. Chest wall vibration / percussion are recommended twice a day by 36% physiotherapist. (Table II)

Table I: Usual chest physiotherapy treatments given to cardiac surgery patients during the first two post-operative days

Variables	Post-surgery day 1	Post-surgery day 2
Breathing exercise	94%(n=141)	87%(n=130)
Coughing	78%(117)	71%(106)
Relaxation techniques	77%(115)	72%(108)
Chest wall vibration /percussion	66%(99)	61%(91)
Postural drainage	58%(87)	55%(83)
Positive expiratory pressure (PEP) device breathing	13%(20)	21.3%(31)
Inspiratory resistance positive expiratory pressure (IR-PEP)	10%(15)	12.5%(18)

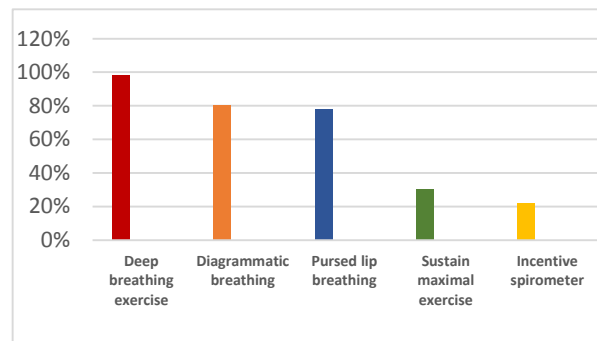


Figure 3. Type of breathing exercise use first post-operative days

Table II. Top Five chest physiotherapy exercise and breathing exercises given to cardiac surgery patients during the initial post-operative days

Variables	Hourly	Thrice a day	Twice a day	Never
Deep breathing exercise	48%	18%	13%	0%
Diagrammatic breathing	31%	20%	12%	3%
Pursed lip breathing	12%	27%	10%	5%
Coughing	3%	32%	24%	8%
Chest wall vibration /percussion	9%	24%	36%	4%

Discussion

This is the main investigation in Pakistan to depict the kind of breathing activities after heart medical procedure. Chest physiotherapy practice in Pakistan has numerous similitudes with the worldwide practice systems.¹¹⁻¹³ Numerous different systems are use other than early assembly in our examination the majority of the physiotherapist suggested profound breathing activity in post heart medical procedure days, results are like the past directed investigations, an investigation from Sweden shows profound breathing activity as almost every now and again utilized chest physiotherapy⁹ another examination from Canada by overrend et.al¹³ and from Australia¹² concurs with the explanation that profound breathing activities was the most regularly used strategy. Diagrammatic breathing is selected widely in clinical practice post-operatively. In an earlier report by Yukio Kuniyoshi et.al Diaphragmatic breaking is a helpful technique¹⁴ be that as it may, in the greater part of the writing pressure gadgets is utilized broadly in clinical practice post-operatively¹⁵ The ideal procedure isn't set up, and there are directly no methodical surveys on the most positive breathing strategy after cardiovascular medical procedure. Moderate number of member used to perform pursed lip breathing (PLB) and incentive spirometer (IS) which diminishes atelectasis and improve pneumonic capacity after coronary artery sidestep medical procedure (CABG)¹⁶ however on another side breathing activities, hacking and huffing systems presents no additional advantages after CABG surgery.¹⁷ Efficacy of breathing and hacking practices in the anticipation of aspiratory complexities

after coronary vein medical procedure has not yet demonstrated the occurrence of preventive proportion of postoperative pulmonary complications (PPCs) and CABG medical procedure. Institutionalized rules might be required to all the more likely match clinical practice with current literature¹⁸ and prophylactic chest physiotherapy after routine coronary artery medical procedure ought to be audited.¹⁹ 22% physiotherapist favored motivating force spirometry in post-medical procedure days ,as indicated by our investigation it's the fifth most basic breathing activity, an examination was perform in 2001 by Tom J et al expressed impetus spirometry doesn't diminish the postoperative pneumonic intricacies.¹³ That there was not watched any sort of critical improvement in patients experiencing CABG medical procedure by utilizing maximal respiratory weight, Spiro metric factors and oxygen immersion.²⁰ Another examination by Reines HD et.al expressed chest physiotherapy neglected to anticipate atelectasis in post cardiovascular patient.^{18,19} As our examination shows positive expiratory pressure (PEP) gadget breathing is used by 22% of physiotherapist an investigation by Jenny Öрман finished up just one trailed of six indicated constructive outcome which isn't sufficient to welcome it According to this outcome, the impact of the treatment is dubious. Still same strategies are being utilized. A more profound methodology on chest physiotherapy must be set up and recharging of system is need of the time. This dynamic distinction result is disturbing and call towards genuine need of new exercise designs. A study by Dr. sana et.al shows the constructive outcome of chest physiotherapy methods with preparation.²⁰ Studies ought to be directed to explain the impact of every strategy separately.

Conclusion

Physiotherapy and Breathing exercise are mostly used in post-operative cardiac procedures. Every Hour breathing activities, diaphragmatic breathing and used to perform pursed lip breathing exercise the highly recommended regime practiced. Guideline for the duration after discharge varies.

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