Original Article

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Effectiveness of Active Cycle of Breathing Technique along with Postural Drainage Versus Autogenic Drainage in Patients with Chronic Bronchitis

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Abstract

Introduction: Chronic bronchitis (CB) is a common but variable phenomenon in chronic obstructive pulmonary disease (COPD). It has numerous clinical consequences, including an accelerated decline in lung function, greater risk of the development of airflow obstruction in smokers, a predisposition to lower respiratory tract infection, higher exacerbation frequency, and worse overall mortality [1]. *Need of the Study:* There are many research done on breathing exercises & bronchial hygiene techniques for chronic bronchitis but n comparison between active cycle of breathing technique along with postural drainage over autogenic drainage. This study is focused to find out the effects of active cycle of breathing technique along with postural drainage over autogenic drainage. *Hypothesis:* Experimental Hypothesis There is significant difference between the effect of Active cycle of breathing technique along with postural drainage over autogenic drainage in chronic bronchitis patients. *Null Hypothesis:* There is no significant difference between the effect of Active cycle of breathing technique along with postural drainage over autogenic drainage in chronic bronchitis patients. *Review of Literature:* Ada Clarice Gastaldi, PhD, (2015) This study aims to evaluate the acute effects of an oscillating positive expiratory pressure device (flutter) on airways resistance in patients with chronic obstructive pulmonary disease (COPD). 15 COPD outpatients with thirty minutes of flutter exercises: a "flutter-sham" procedure was used as a control, and airway responses after a short-acting bronchodilator were also assessed. The use of flutter can decrease the respiratory system resistance and reactance and expiratory flow limitation in stable COPD patients with small amounts of secretions [22]. 2. EleonoraVolpato, Paolo Banfi, (2015) This meta-analysis aimed to assess evidence from the scientific literature on the effects of relaxation techniques, investigated 9 databases to select 25 RCTs. Although higher quality research is required, our results sustain the importance of relaxation techniques as a tool to manage COPD [23]. 3. Susan D Hanekom, Dina Brooks, 2012) Postoperative pulmonary complications remain the most significant cause of morbidity following open upper abdominal surgery despite advances in preoperative care. An expert Delphi panel interpreted the equivocal evidence for the physiotherapeutic management of patients following upper abdominal surgery. Through a process of consensus a clinical management algorithm was formulated [24]. *Methodology:* 30 Subjects divided randomly into two groups; namely experimental group A and control group B, consisting of 15 subjects each. Both the groups were assessed before the training session to exclude any pre-existing pulmonary and cardiac conditions. Group A was treated with Active cycle of breathing technique with postural drainage and Group B received autogenic drainage. *Discussion:* This study was design to compare effectiveness of two airway clearance techniques. It was a comparative study, 30 patients with chronic bronchitis are taken subjects divides into Group A and Group B. 30 patients of chronic bronchitis of each group are distributed by convenient sampling. Group A was performed with active cycle of breathing technique along with postural drainage; Group B was performed with autogenic drainage only, duration for 4 weeks. Statistical 't' test for analyzing pre and post result. In this study Conclusion. This study, concluded active cycle of breathing technique with postural drainage and autogenic drainage are effective individualy but comparatively there is no significant difference between two groups. *Limitations of Study:* 1. The sample size in this study was small, larger sample was not taken. 2. As the study was done on chronic bronchitis patients, it can be done on other COPD patients. 3. Sometimes the patients are uncooperative, unconcious and no longer stayed. *Suggestions for Further Studies:* 1. This study used only four tools in detecting the improvement in chronic bronchitis patients, studies can be done with other parameters like pulmonary function testing and arterial blood gas analysis. 2. As this study was done only with smokers, further studies could be done with other types of patients. 3. The comparison between active cycle of breathing technique and other training modes like percussion, vibrations, incentive spirometery can be studied, as the later is also concerned with the better outcome in recent studies.

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Keywords: Couch, Peak flow meter; Pulse oxymeter; Timer; Stethoscope; Pillows; Borg's scale; Oxygen saturation level (SaO_2); Peak expiratory flow rate (PEFR); Rate pressure product (RPP) and Borg scale (rate of perceived exertion).

Introduction

Chronic bronchitis (CB) is a common but variable phenomenon in chronic obstructive pulmonary disease (COPD). It has numerous clinical consequences, including an accelerated decline in lung function, greater risk of the development of airflow obstruction in smokers, a predisposition to lower respiratory tract infection, higher exacerbation frequency, and worse overall mortality [1].

Chronic bronchitis is a disease characterized by cough productive of sputum on most days for at least three consecutive months of each year for at least two successive years. The sputum may be mucoid or mucopurulent and sub divisions of chronic bronchitis into simple mucopurulent and obstructive were previously popular [2].

Chronic bronchitis is one of the common COPD disorder affecting 10-15% of adult population over the age of 55. Its prevalence is increasing and it is characterized by the presence of airflow obstruction that is generally progressive may be accompanied by hyperactivity. Most of the smokers are prone for this and it is defined as any patient who coughed up sputum on most days of at least 3 consecutive months for more than 2 successive years [3]. [Fig. 1]

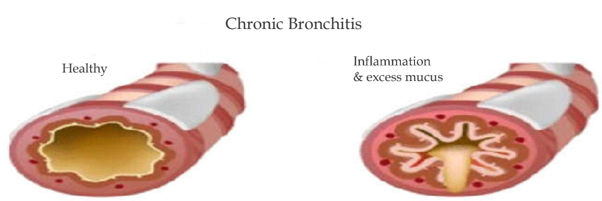

Fig. 1: Chronic bronchitis

Chronic bronchitis is one of the common COPD disorder affecting 10-15% of adults over the age of 55, its prevalence is increasing and it is characterized by the presence of air flow obstruction that is generally progressive, may be accompanied by hyperactivity and may be partially reversible. Most of the smokers are prone for this. The patient is said to have bronchitis if there is cough with sputum for three consecutive months for more than two successive years [4].

Active cycle of breathing technique is a flexible method of treatment used to mobilize and clear excess bronchial secretions. It is effective in improving lung function and does not increase airflow obstruction and also effective in clearance of bronchial secretions. It is a cycle of breathing control, thoracic expansion exercise and the forced expiration technique [22].

Need of the Study

There are many research done on breathing exercises & bronchial hygiene techniques for chronic bronchitis but n comparison between active cycle of breathing technique along with postural drainage over autogenic drainage. This study is focused to find out the effects of active cycle of breathing technique along with postural drainage over autogenic drainage.

Aims of the Study

The main objectives of the study were:

1. To find the effects of active cycle of breathing techniques with postural drainage in chronic bronchitis patients.
2. To find the effects of autogenic drainage in chronic bronchitis patients.
3. To compare the effects of active cycle of breathing technique along with postural drainage over autogenic drainage chronic bronchitis patients.

Hypothesis

Experimental Hypothesis

There is significant difference between the effects of Active cycle of breathing technique along with postural drainage over autogenic drainage in chronic bronchitis patients.

Null Hypothesis

There is no significant difference between the effect of Active cycle of breathing technique along with postural drainage over autogenic drainage in chronic bronchitis patients.

Review of Literature

Anatomy and Physiology

Respiratory tract is the anatomical structure through which air moves in and out. It includes nose, pharynx, larynx, trachea, bronchi and lungs. [Fig. 2]

Pleura

Each lung is enclosed by a bilayered serous membrane called pleura or pleural sac. Pleura has two layers namely inner visceral and outer parietal layers. Visceral layer is attached firmly to the surface of the lungs. At hilum, it is continuous with parietal layer, which is attached to the wall of thoracic cavity.

Intrapleural Space or Pleural Cavity

Intrapleural space or pleural cavity is the narrow space in between the two layers of pleura.

Intrapleural Fluid

Intrapleural space contains a thin film of serous fluid called intrapleural fluid, which is secreted by the visceral layer of the pleura.

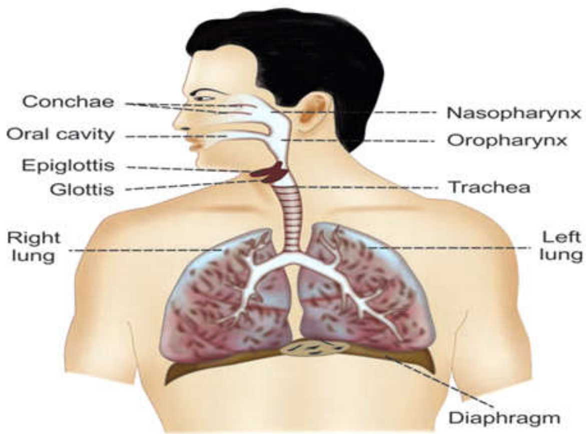

Fig. 2: Respiratory tract

Upper and Lower Respiratory Tracts

Generally, respiratory tract is divided into two parts:

1. Upper respiratory tract that includes all the structures from nose up to vocal cords; vocal cords are the folds of mucous membrane within larynx that vibrates to produce the voice
2. Lower respiratory tract, which includes trachea, bronchi and lungs.

Respiratory unit

Parenchyma of lungs is formed by respiratory unit that forms the terminal portion of respiratory tract. Respiratory unit is defined as the structural and functional unit of lung. Exchange of gases occurs only in this part of the respiratory tract.

Structure of respiratory unit

Respiratory unit starts from the respiratory bronchioles. Each respiratory bronchiole divides into alveolar ducts**.** Each alveolar duct enters an enlarged structure called the alveolar sac. Space inside the alveolar sac is called antrum**.** Alveolar sac consists of a cluster of alveoli. Few alveoli are present in the wall of alveolar duct also.

Thus, respiratory unit includes:

1. Respiratory bronchioles
2. Alveolar ducts
3. Alveolar sacs
4. Antrum
5. Alveoli.

Each alveolus is like a pouch with the diameter of about 0.2 to 0.5 mm. It is lined by epithelial cells.

Alveolar Cells or Pneumocytes

Alveolar epithelium consists of alveolar cells or pneumocytes, which are of two types namely type I alveolar cells and type II alveolar cells.

Type I alveolar cells are the squamous epithelial cells forming about 95% of the total number of cells.

These cells form the site of gaseous exchange between the alveolus and blood.

Type II alveolar cells are cuboidal in nature and form about 5% of alveolar cells. These cells are also called granular pneumocytes. Type II alveolar cells secrete alveolar fluid and surfactant. [Fig. 3]

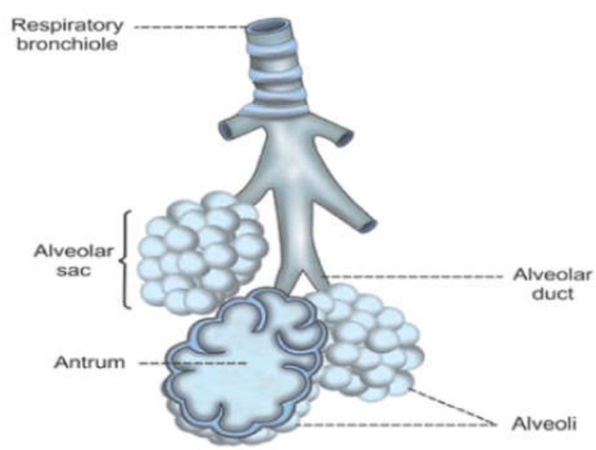

Fig. 3: Respiratory unit

Exchange of respiratory gases in lungs

In the lungs, exchange of respiratory gases takes place between the alveoli of lungs and the blood. Oxygen enters the blood from alveoli and carbon dioxide is expelled out of blood into alveoli. Exchange of gases between blood and alveoli takes place through respiratory membrane [4].

The exchange of gases between the air we breathe and the pulmonary capillary blood. We are primarily concerned with two gases, O_2 and CO_2, but what follows applies in concept to all gases (that are not chemically reactive with tissues). Moreover, it does not matter whether the gas is being passed from air to blood (e.g. O_2) or from blood to gas (e.g. CO_2) because the principles governing gas exchange apply equally in both directions. By exchanging gases, the lungs form one critical part of the O_2/CO_2 transport pathway, the rest of which involves the entire cardiovascular system (heart, vasculature and blood) as well as the body tissues. The lungs are a collection of some 300 million very small gas-filled polyhedrons (alveoli), the walls of which are made up of little more than a rich capillary network supported by a very thin interstitial matrix. Each alveolus expands with fresh gas (high in O_2 and low in CO_2) that has flowed down the bronchial tree from the mouth during inspiration. The alveoli then reduce in volume during expiration, returning gas (lower in O_2 and higher in CO_2) up the bronchial tree to the mouth. This process is of course called ventilation. The capillaries in the alveolar wall are fed pulmonary arterial blood returned from the tissues. This blood is low in O_2 and high in CO_2, but after the blood has flowed through the alveolus and reaches the pulmonary veins, O_2 has been raised and CO_2 lowered through the gas exchange process. Normally, all alveoli are both The exchange of gases between the alveolar gas and the blood occurs by simple, passive diffusion. There is no active transport involved in alveolar gas exchange, and the process of diffusion requires no energy expenditure by the organism. Of course, both ventilation and perfusion are convective processes that do require energy expenditure, and in many common cardiorespiratory diseases, either or both may be compromised [5]. [Fig. 6]

Pathophysiology

Chronic bronchitis is a recurring inflammation and degeneration of the bronchial tubes that may be associated with active infection. Chronic bronchitis is often a part of an underlying disease process, such as asthma, cystic fibrosis, dyskinetic cilia syndrome, foreign body aspiration or exposure to an airway irritant. Recurrent tracheobronchitis may also be seen in patients with tracheostomy or with certain forms of immunodeficiency. In all these patient groups, chronic bronchitis should not be the primary diagnosis because it does not describe the pathology of the underlying disorder. Patients with chronic bronchitis have more mucus than normal because of either increased production or decreased clearance. Coughing is the mechanism by which excess secretion is cleared. In adults, chronic bronchitis results from hyper secretion of mucus in the bronchi due to hypertrophy of the submucosal

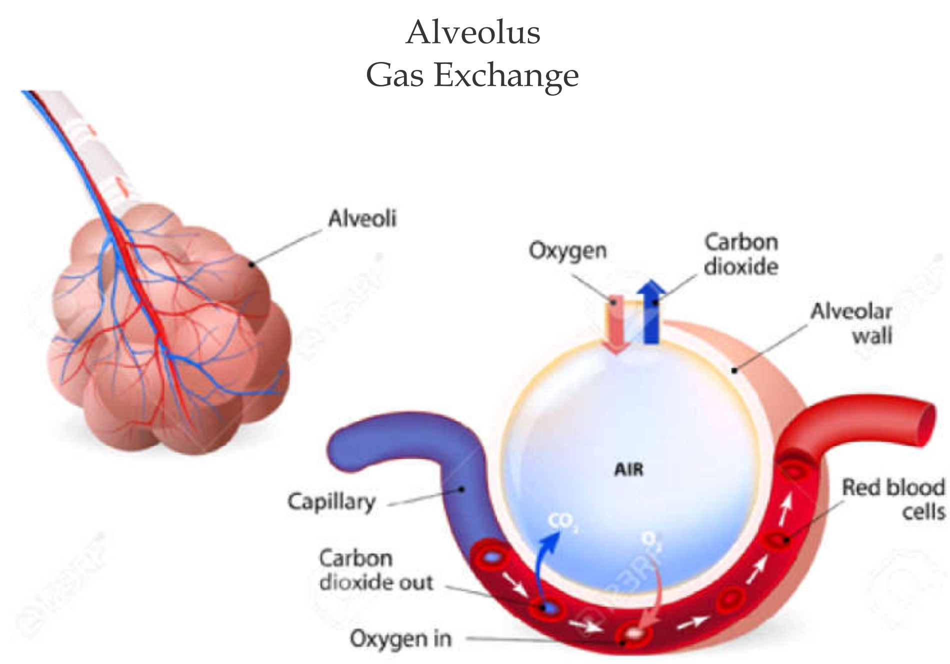

Fig. 4: Alveolar gas exchange

mucus producing glands and increased number of goblet cells within the epithelium. In most patients, this results from exposure to cigarette smoke. Mucociliary clearance is delayed because of excessive mucus production and loss of ciliated cells leading to productive cough [6]. [Fig. 5].

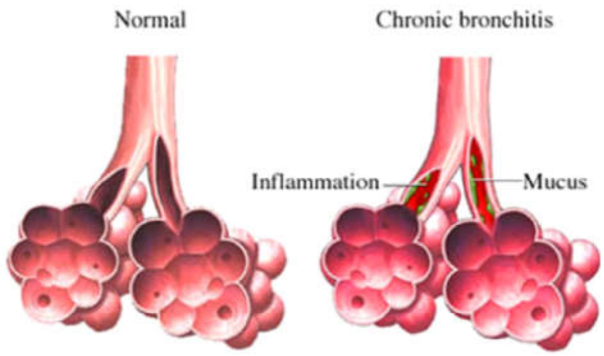

Fig. 5: Pathophysiolgy of chronic bronchitis

Some irritative substance stimulates over activity of the mucus secreting glands and the goblet cells in the bronchi and in the bronchioles which causes secretion of a vast excess of mucous. This mucus coats the walls of the airways and tends to clog the bronchioles (this is functionally more important) [7].

Epidemiology

A survey for the prevalence of chronic bronchitis in an industrial population in North India is reported. The prevalence of chronic bronchitis is 12-15% in 473 subjects between the ages of 17 and 64 years. The prevalence of chronic bronchitis in smokers is five times the prevalence in non-smokers and is similar to the values reported for light smokers in other surveys. These observations suggest that cigarette smoking is associated with the development of chronic bronchitis, and the differences in the prevalence rate of chronic bronchitis between this survey and other surveys conducted shows are mainly due to differences in smoking habits. Air pollution has a minor effect only and ethnic differences do not appear to play any part. Forced expired volume in one second shows a negative correlation with age. It is lower in asymptomatic smokers than in non-smokers and is lower in chronic bronchitis than in controls [8]. Chronic bronchitis is one of the common COPD disorder affecting 10-15% of adult population over the age of 55. Its prevalence is increasing and it is characterized by the presence of airflow obstruction that is generally progressive may be accompanied by hyperactivity. Most of the smokers are prone for this and it is defined as any patient who coughed up sputum on most days of at least 3 consecutive months for more than 2 successive years [3].

Aetiology

This is more common in middle to late adult life and in men more than women (ratio 5:1). Atmospheric pollution (e.g. cigarette smoking or coal dust) will predispose to the development of the disease and it is more common in urban areas than in rural areas. It is more prevalent in socio-economic groups 4 and 5 and is costly in terms of working days lost annually in Britain [7]. The etiology of chronic bronchitis although the initiating and propagating mechanism for the development of these diseases are still unclear. Disability usually only becomes apparent when the processes of destruction have been in progress for 20 years or more, so that patients present with symptoms in middle to old age. Smoking, especially of cigarettes, is a major causative factor and urban industrial air pollution and dusty occupations are also associated with increased incidence of these diseases. Lower respiratory tract infection, once thought to be a major causative factor, is now regarded as of lesser importance. Many patients, especially of the bronchitic type, are suscepitible to recurrent infections which produce worsening of dyspnoea and cough with recognizable additional temporary impairment of pulmonary function [2]. [Fig. 6]

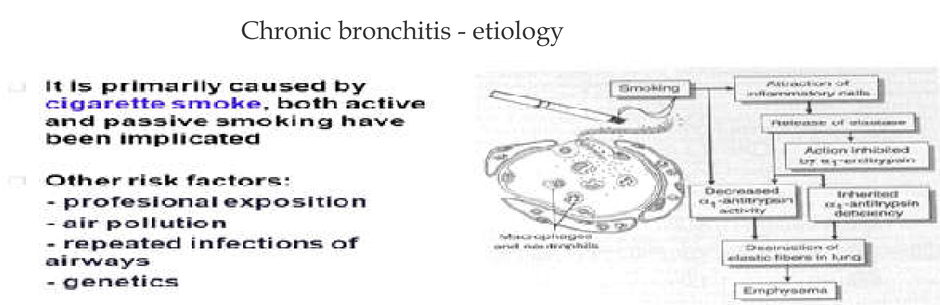

Fig. 6: Aetiolgy of chronic bronchitis

Author's Statement:

1. *Ada Clarice Gastaldi, PhD, (2015):* This study aims to evaluate the acute effects of an oscillating positive expiratory pressure device (flutter) on airways resistance in patients with chronic obstructive pulmonary disease (COPD). 15 COPD outpatients with thirty minutes of flutter exercises: a "flutter-sham" procedure was used as a control, and airway responses after a short-acting bronchodilator were also assessed. The use of flutter can decrease the respiratory system resistance and reactance and expiratory flow limitation in stable COPD patients with small amounts of secretions [22].
2. *Eleonora Volpato, Paolo Banfi, (2015):* This meta-analysis aimed to assess evidence from the scientific literature on the effects of relaxation techniques, investigated 9 databases to select 25 RCTs. The assessed quality of the studies, based on the Pedro Scale, was generally medium/high. Relaxation training can have a moderate impact on both psychological well-being and respiratory function, resulting in noticeable improvements in both. Although higher quality research is required, our results sustain the importance of relaxation techniques as a tool to manage COPD [23].
3. *Susan D Hanekom, Dina Brooks, (2012):* Postoperative pulmonary complications remain the most significant cause of morbidity following open upper abdominal surgery despite advances in preoperative care. The objective was to develop a clinical management algorithm for the post operative management of abdominal surgery patients. Eleven draft algorithm statements extracted from the extant literature by the primary research team were verified and rated by scientist clinicians (n = 5) in an electronic three round Delphi process. An expert Delphi panel interpreted the equivocal evidence for the physiotherapeutic management of patients following upper abdominal surgery. Through a process of consensus a clinical management algorithm was formulated [24].
4. *C Thompson, S Harrison and D Smith (2002):* A randomised crossover study was performed in 17 stable patients with non-cystic fibrosis bronchiectasis at home, in which 4 weeks of daily active cycle of breathing technique (ACBT) were compared with 4 weeks of daily physiotherapy with the Flutter device. A questionnaire indicated subjectively that patients preferred the Flutter (11/17) to ACBT for routine use. Daily use of the Flutter device in the home is as effective as ACBT in patients with non-cystic fibrosis bronchiectasis and has a high level of patient acceptability [27].
5. *Stevenson NJ & Calverley PM (2004):* In their study in U.K about the effects of oxygen on recovery from exercise in patients with COPD, 18 patients with moderate COPD performed symptom limited exercise on a cycle ergometer. During recovery they received either air or oxygen at identical flow rates in a randomized, single blind crossover design. When oxygen was given, the time taken for resolution of dynamic hyperinflation was significantly shorter and concluded that oxygen reduces the degree of dynamic hyperinflation during recovery from exercise but does not make the patient feel less breathless than breathing air [29].

Method and Methodology

Sample

This study was an experimental design. Thirty male and female subjects with chronic bronchitis aged between 30-60 years were selected according to convenience (purposive) sampling based on the selection criteria. All the subjects considered for the study belong to SMIH Hospital, Patel Nagar, Dehradun. These subjects were then randomly assigned into two groups of fifteen subjects each namely Experimental Group A and control Group B. All the participants took part in the experiments on a voluntary basis after signing a consent form and a demographic data was collected from each subject. The purpose of the study was explained to all the subjects. Inclusion criteria, Patients clinically diagnosed as chronic bronchitis, male and female both individuals, Age group from 30-60 years and Patients who are smokers. Exclusion criteria subjects were excluded Patients with mild or severe form of chronic bronchitis, Age less than 30 and more than 60 years, Non-smokers, Patients with severe acute asthma, emphysema, rib fracture, History of any recent thoraco abdominal surgery, History of any cardio-vascular diseases. Instrumentation for data collection includes therapeutic Ultrasound machine, Universal goniometry, Visual analogue scale, Couch, Peak flow meter, Pulse oxymeter, Timer, Stethoscope, Pillows and Borg's scale, Oxygen saturation level (SaO_2), Peak expiratory flow rate (PEFR),. Rate pressure product (RPP) and Borg scale (rate of perceived exertion) [Fig. 7]

Fig. 7: Materials used such as Pulse oximeter, Peak flow meter, Stethoscope

Procedure:

Thirty subjects clinically diagnosed of chronic bronchitis were selected according to inclusion and exclusion criteria and divided randomly into two groups; namely experimental group A and control group B, consisting of 15 subjects each. Both the groups were assessed before the training session to exclude any pre-existing pulmonary and cardiac conditions. A brief explanation about the treatment session was explained to all the subjects. The treatment duration for both the groups was given as listed below:

Duration per session: 15 minutes / session

No of session per day: 1 session / day

Duration of the study: 1 month

The pre & post test values of O_2 saturation, Peak expiratory flow rate, Rate pressure product and Rate of perceived exertion were noted before and at the end of month of treatment. Group A was treated with Active cycle of breathing technique with postural drainage and Group B received autogenic drainage.

Group A (Active Cycle of Breathing Technique with postural drainage)

ACBT is a cycle of breathing including breathing control, thoracic expansion exercises and forced expiration technique.

1. Breathing Control

The subjects were in a comfortable and well supported in upright (postural drainage) position. They were encouraged to relax the upper chest, shoulders and arms while using the lower chest. One hand, either the patients' or the therapist's was positioned lightly on the upper abdomen. As the subjects breathed in, the hand was felt to rise up and out whereas the hand sank down and in when the subjects breathed out. Inspiration is the active phase and expiration was relaxed and passive, both inspiration and expiration were barely audible.

2. Thoracic Expansion Exercises

The subjects were in a comfortable and well supported upright (postural drainage postion) position. They were encouraged to do deep inspiration. Inspiration was totally active and combined with a 3 second hold before the passive relaxed expiration. Thoracic expansion exercises were encouraged with proprioceptive stimulation, by placing a hand of the patients' or therapist's over the part of a chest wall when the movement was encouraged.

3. Forced Expiration Technique

The subjects were in a comfortable and well supported in upright position. A combination of 1-2 forced expirations (huffs) and a period of breathing control were given. Breathing control was given for 10 seconds and then followed by expiration with open glottis. Coughing or huffing was preferred according to the subjects. Huffing was given to move the more peripherally situated secretions and when secretions have reached the larger more proximal upper airways, a huff or cough from a high lung volume was used to clear the secretions. [Fig. 8]

Group B (Autogenic Drainage)

The subject was seated in upright position on a couch with back support. The upper air ways were cleared of secretions by huffing or blowing the nose. Therapist was seated to the side and slightly behind the subject, closes enough to hear the subject's breathing. Subject's hands were placed on abdomen to feel the work of abdominal muscles and the physiotherapist's hand placed on the upper chest to feel the secretions. Inhalation was done slowly through the nose, using diaphragm and two to three seconds breath hold allowing collateral ventilation to get air behind the secretions. Exalation was done through the mouth. The vibration of mucus was felt by therapists hand placed on upper chest. The frequency of vibrations revealed their locations. High frequencies reveal secretions located in small airway. Low frequencies mean that secretions were moved to larger airways. The technique includes unsticking, collecting and evacuating phases. At the end of the session the mucus was evacuated by a stronger expiration or a high volume huff. [Fig. 9]

Fig. 8: A Subject Performing Active Cycle of Breathing Technique with postural Drainage

Fig. 9: A Subject Performing Autogenic Drainage

Fig. 10: A Subject Performing PEFR

Data Analysis

The data was analysed using GraphPad Prism 8.0.1, Paired t-test was used to analyse SaO_2, (saturation oxygen level), PEFR (peak expiratory flow rate), RPP (rate pressure product) and RPE (rate of perceived exertion) between experimental and control group.

Results

This chapter deals with the result after data analysis using GraphPad prism 8.0.1. Result were calculated by using p<0.05 level of significance was taken paired t-test was used to compare data.

Analysing SaO_2 in experimental group revealed significant changes with mean±SD (1.800±1.424) as compared to control group with mean±SD (1.267±0.5936). [Table 1]

Analysing PEFR in experimental group revealed significant changes with mean±SD (42.00±43.46) as Compared to control group with mean±SD (45.33±36.03). [Table 2]

Analysing RPP in experimental group revealed significant changes with mean±SD (246.5±1161) as compared to control group with mean±SD (-946.7±1218). [Table 3]

Analysing RPE in experimental group revealed significant changes with mean±SD (-1.533±1.246) as compared to control group with mean±SD (-0.8667±0.9155). [Table 4]

Analysing SaO_2, PEFR, RPP & RPE comparison between experimental and control group revealed significant changes with MEAN±SD -0.4000±3.924, 43.33±66.08, -542.7±1380 & -0.6000±5.221 [Table 5]

Analysing SaO_2 between experimental and control group revealed no significant change with mean±SD (-0.4000±3.924).[Fig. 11 & Fig. 12]

Analysing PEFR between experimental and control group revealed no significant change with mean±SD (43.33±66.08). [Fig. 13 & Fig. 14]

Analysing RPP between experimental and control group revealed no significant change with mean±SD (-542.7±1380). [Fig. 15 & Fig. 16]

Analysing RPE between experimental and control group revealed significant change with mean±SD (-0.6000±5.221). [Fig. 17& Fig. 18]

Table 1: Intra group comparison of SaO_2 between experimental and control group

Group	MEAN±SD	P value
Experimental Group	1.800±1.424	<0.0002
Control Group	1.267±0.5936	<0.0001

Table 2: Intra group comparison of PEFR between experimental and control group

Group	MEAN±SD	P value
Experimental Group	42.00±43.46	<0.0022
Control Group	45.33±36.03	<0.0002

Table 3: Intra group comparison of RPP between experimental and control group

Group	MEAN±SD	P value
Experimental Group	246.5±1161	<0.4248
Control Group	-946.7±1218	< 0.0094

Table 4: Intra group comparison of RPE between experimental and control group

Group	MEAN±SD	P value
Experimental Group	-1.533±1.246	<0.0003
Control Group	-0.8667±0.9155	<0.0025

Table 5: Inter group comparison between experimental and control group

Outcome Measures	MEAN±SD	P value
SaO_2	-0.4000±3.924	<0.6990
PEFR	43.33±66.08	<0.0236
RPP	-542.7±1380	<0.1501
RPE	-0.6000±5.221	<0.6631

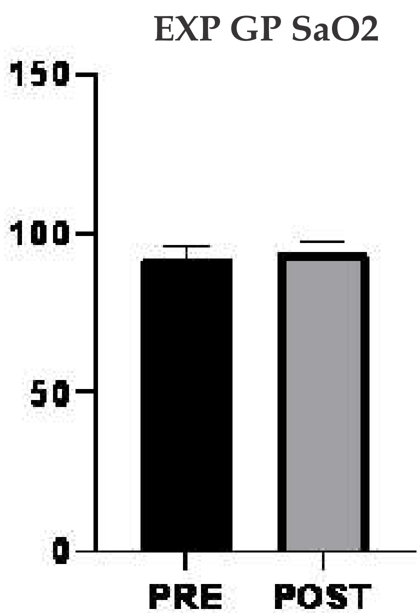

Fig. 11: Graph of SaO_2 of experimental group

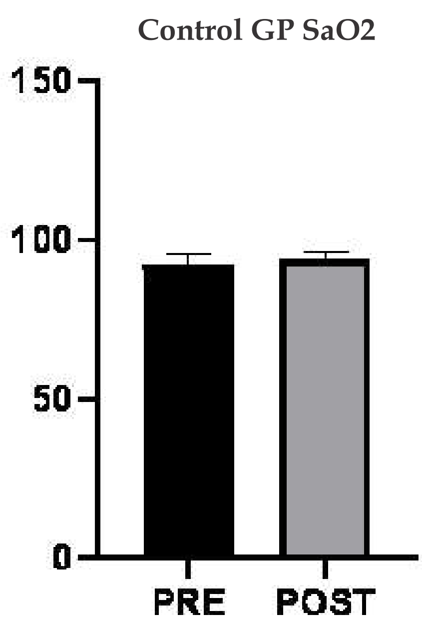

Fig. 12: Graph of SaO_2 of control group

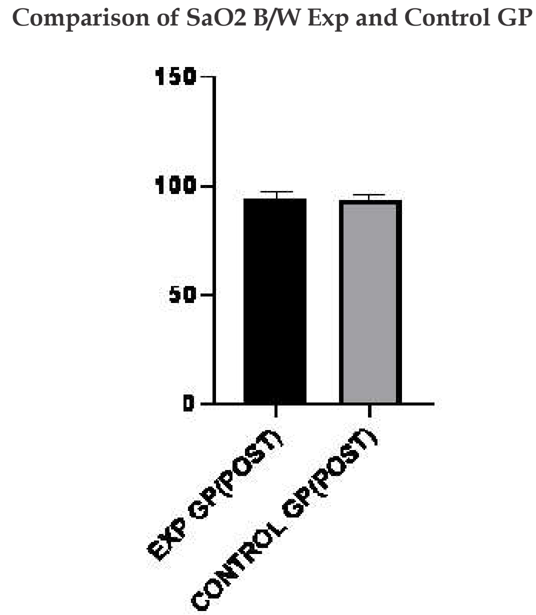

Fig. 13: Graph of comparison of SaO_2 between experimental and control group

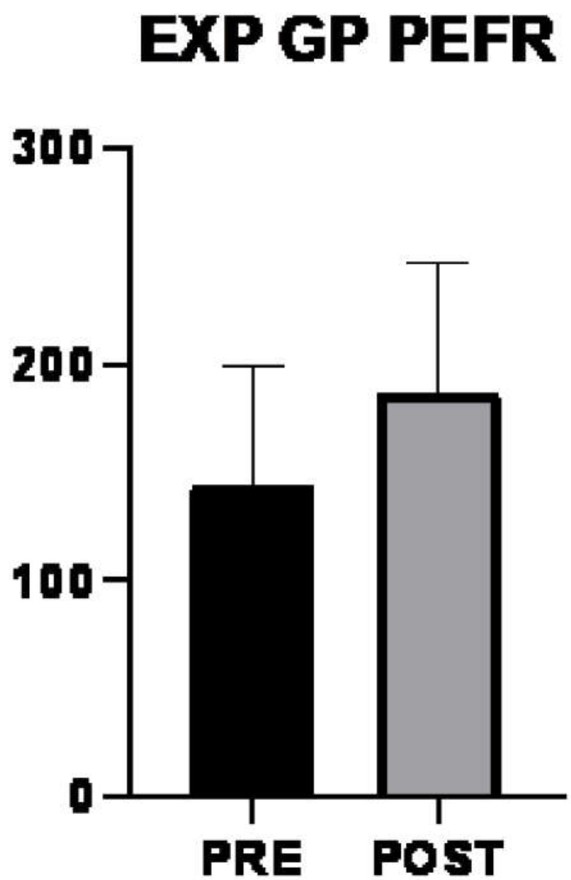

Fig. 14: Graph of PEFR of experimental group

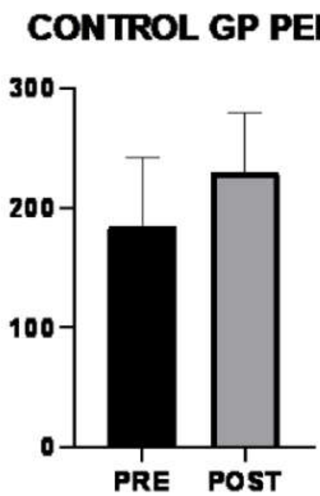

Fig. 15: Graph of PEFR of control group

Comparison B/W Exp and Control GP PEFR (PO ST)

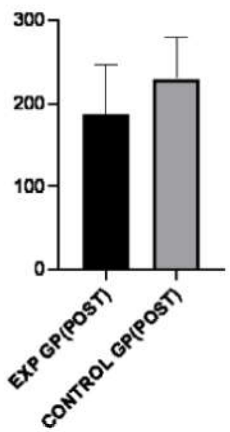

Fig. 16: Graph of comparison of PEFR between experimental and control group

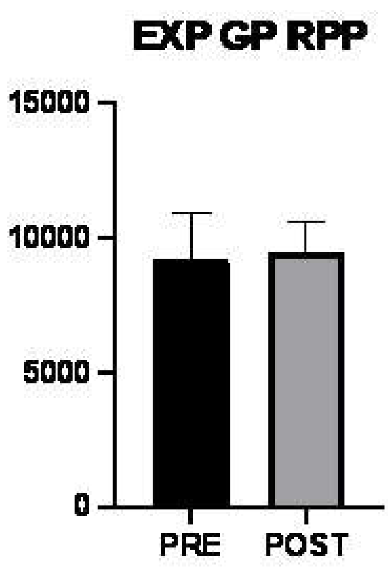

Fig. 17: Graph of RPP of experimental group

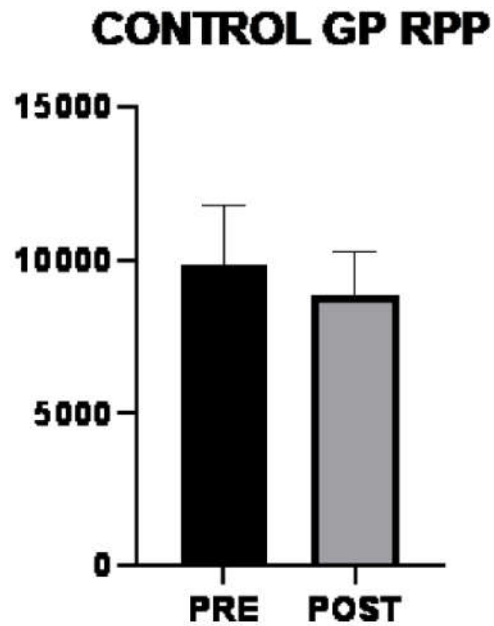

Fig. 18: Graph of RPP of control group

Discussion

This study was design to compare effectiveness of two airway clearance techniques. It was a comparative study, 30 patients with chronic bronchitis are taken subjects divides into Group A and Group B. 30 patients of chronic bronchitis of each group are distributed by convenient sampling. Group A was performed with active cycle of breathing technique along with postural drainage, Group B was performed with autogenic drainage only, duration for 4 weeks. Statistical 't' test for analyzing pre and post result. In this study both the treatment shows that there is small but significant difference in post treatment readings.

Greater risk of the development of airflow obstruction in smokers, a predisposition to lower respiratory tract infection, higher exacerbation frequency, and worse overall mortality. CB is caused by overproduction by luminal obstruction of small airways, epithelial remodeling, and alteration of airway surface tension predisposing to collapse.

However, various surveys in India show the relief in the symptoms of chronic bronchitis by pulmonary rehabilitation including various airways clearance techniques. In many studies, it has been shows that autogenic is effective and safe in clearing secretions and improving SaO_2. It has been found to be an effective method of home physiotherapy also. Postural drainage is a component of bronchial hygiene therapy, it consist of postural drainage, positioning and turning.

Some other studies have shown that the ACBT is more effective to reduce dyspnoea as well as clearance of secretions of the upper respiratory tract and other techniques are effective to clear the secretions in distal bronchial tree. However, subjects were found to have no significant changes in result in both group.

In this present study to aim to find the efficacy of which mode of treatment was better in the two group using four different evaluating tools such as SaO_2, PEFR, RPP and RPE. These parameters are reliable and valid significantly correlated with lung functions. Efforts were made to compare the effects of active cycle of breathing technique with postural drainage and autogenic drainage to improve the efficiency of ventilation, reduces the work of breathing, improve gas exchange, oxygenation and clearance of bronchial secretions in patients with chronic bronchitis.

However there is no stastically significant difference between the 2 groups.

Based in this data we accept the null hypothesis and reject experimental Hypothesis. The study undertaken included patients who had chronic bronchitis with bronchial secretions.

Conclusion

We have shown that there is no significant result between active cycle of breathing technique along with postural drainage and autogenic drainage in clearance of secretions and oxygenation in clinically diagnosed patients with chronic bronchitis. In this study, Active cycle of breathing technique with postural drainage and autogenic drainage are effective individualy but comparatively there is no significant difference between 2 groups.

Limitations of Study

1. The sample size in this study was small, larger sample was not taken.
2. As the study was done on chronic bronchitis patients, it can be done on other COPD patients.
3. Sometimes the patients are uncooperative, unconcious and no longer stayed.

Suggestions for Further Studies

1. This study used only four tools in detecting the improvement in chronic bronchitis patients, studies can be done with other parameters like pulmonary function testing and arterial blood gas analysis.
2. As this study was done only with smokers, further studies could be done with other types of patients.
3. The comparison between active cycle of breathing technique and other training modes like percussion, vibrations, incentive spirometery can be studied, as the later is also concerned with the better outcome in recent studies.

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