



**RESEARCH ARTICLE**

**EVALUATING AND COMPARING THE LEVEL OF EFFICACY OF ACTIVE CYCLE OF BREATHING TECHNIQUE VERSUS CONVENTIONAL PHYSIOTHERAPY IN CHEST CLEARENCE IN CHRONIC BRONCHITIS PATIENTS**

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Active cycle of breathing technique,  
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Chronic bronchitis COPD,  
Sputum clearance.

**ABSTRACT**

**Background and Purpose:** Obstructive airways diseases typically present with dyspnoea, cough and wheeze and defined by a reduced FEV1, and PEFR and accumulation of sputum in the lungs. Sputum clearance and improve pulmonary function test is prime importance in the patients with chronic bronchitis. ACBT has been used to treat the patients with tenacious sputum and also conventional chest physiotherapy for sputum clearance compares the effect of both treatments on pulmonary functions and sputum clearance. The purpose of the study was to compare the efficacy of Active cycle of breathing technique and Conventional chest physiotherapy in patients with chronic bronchitis.

**Methods:** Thirty male and female patients with chronic bronchitis patients were trained and randomly assigned into two groups and apply each treatment three times in a week. The experiment was conducted at their places. Following FEV1, PEFR, CHEST X-RAYS dependent variables were measured on base line and after completion of study.

**Conclusion:** The result of the study revealed that there are significant differences in FEV1, PEFR and X-RAYS READINGS between the groups.

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**INTRODUCTION**

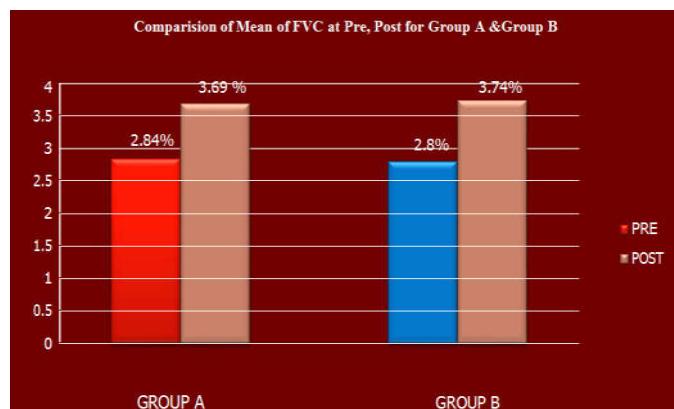
Chronic Obstructive Pulmonary Disease (COPD) is the most common chronic pulmonary disorder (Suliven, 4<sup>th</sup> edition). It is a heterogeneous condition embracing several overlapping pathological process including chronic bronchitis and emphysema (Davidson's principles and practice of medicine 20<sup>th</sup> edition). The Global Burden of Disease Study estimated that in 1990, the worldwide prevalence of COPD was 9.34 per 1000 men and 7.33 per 1000 women Pathologically, Chronic bronchitis is a non-infective condition of the Mucosal cells lining, the bronchi and bronchioles of the lungs, giving rise to progressive Mucus gland hypertrophy, mucosal swelling and increased mucus production (Article, S.K. Jindal *et al.*, 2006). This eventually produces diffuse airways obstruction and a decrease in the lumen of the tubes from which clearance must occur. Active inspiration permits air to be drawn through narrow airway but during the passive deflation during expiration and diminished diameter of these airways reduces expiratory airflow rate. Any expiratory effort of coughing leads to further obstruction and collapse of the bronchi and

bronchioles and trapping of air in periphery of the lungs (Harsh mohan a text book of pathology, 5<sup>th</sup> edition). During the inspiratory phase of normal respiration the volume of thoracic cage is increased by the active muscular effort. Negative thoracic pressure is increased correspondingly and as a result of this the lung volume increases. Active cycle of breathing technique (ACBT) consist of repeated cycles of three ventilator phase, Breathing control, thoracic expansion exercise and the Forced Expiratory Technique (FET) (Rehabilitation medicine, 2<sup>nd</sup> edition). The Purpose of Active Cycle of Breathing Technique (ACBT) is to improve the clearance of secretion, thereby decreasing airway obstruction and enhancing ventilation, and gas exchange and help in improving pulmonary function. Conventional Chest physical therapy (CPT) is a widely used intervention for patients with airway diseases. The main goal is to facilitate secretion transport and thereby decrease secretion retention in the airways. Historically, conventional CPT has consisted of a combination of forced expirations (directed cough or huff), postural drainage, percussion, vibrations or shaking. CCPT improves mucus transport.

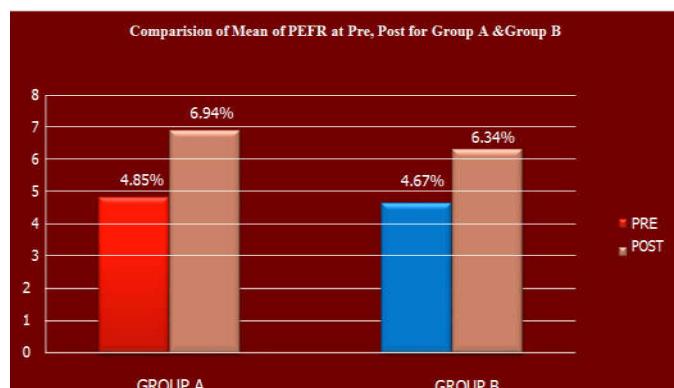
**Subjects and Methods:** 30 Patients who were diagnosed cases of chronic bronchitis and reported a history of disease for at

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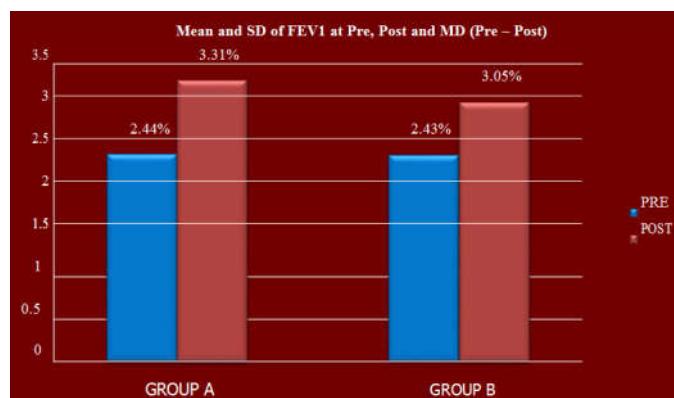
least 2 years. All the subjects had productive cough as their chief complaint. Also the subjects had no co-morbidity. and exclusion criteria in this study included Neurological deficit, Diabetes or moderate hypertension, Obese, Uncooperative patients. Patients were initially divided into 2 groups of 15 each. Group A is treated with Active cycle of breathing technique, 3days a week for 4 weeks. Conventional chest Physiotherapy Group treated with Postural drainage, percussion and vibrations. Active cycle of breathing technique Group ACBT Group is treated with : Active cycle of breathing technique Consist of 3 steps –Step 1 Relaxed breathing ,Step 2 Deep breathing with hold for 3-4 sec, Step 3 Huff and then Cough and Group B Conventional chest Physiotherapy consisting of Postural drainage, Percussion and Vibrations. Both groups are given respective treatments for 3 days in a week and carried for to 4 weeks. Outcome measures were used PEFR, FVC, FEV1 and Chest X ray.



**Fig.1. Graphical representation FVC between Group A and Group**



**Fig.2. Comparison of improvement in PEFR between Group A & Group B**



**Fig.3. Comparison of improvement in FEV1 between Group A & Group B**

## Data Analysis

Statistical study of the evaluation was done using SPSS 13 and Chi square test was used for assessing statistical significance.

## RESULTS

3.69% improvement in FVC in group A and in group B 3.74% and in Group A PEFR improve 6.94% and in group 6.34%. In FEV1 Group A 3.31% and Group B 3.05%. There is one level improvement in patients with chronic bronchitis who received ACPT and number of hospital stay is also decreased in group A patients.

## DISCUSSION

As per the results there is significant difference in FEV1, FVC, PEFR and X-RAYS findings between the groups. So the Active cycle of breathing technique and Conventional chest physiotherapy are equally effective in chronic bronchitis cases (Bronchial hygiene therapy, 2002). The active cycle of breathing technique can be taught to patients and attendants from the age of about 2 years with children working independently from about age 8 or 9 years. The Conventional chest physiotherapy can be taught to parents for their children from the age of about 2 to 8 or 9 years, but for their own treatment there is a requirement of physiotherapist. By the results derived from this study we can conclude that both the airway clearance techniques are equally effective, but due to the levels of independence they provide, we need to choose one of the techniques depending upon the availability of the therapist and resources.

## Conclusion

The results of the study revealed that there is significant difference in FEV1, FVC, PEFR and X-RAYS between the groups. In ACBT, the technique can be taught to the patients and their attendants where as in conventional chest physiotherapy there is a requirement of physiotherapist. So the Active cycle of breathing technique and Conventional chest physiotherapy are equally effective in chronic bronchitis cases.

## REFERENCES

- Article, S.K. Jindal et al. A multicentric study on epidemiology of copd and it's relationship with tobacco smoking and environmental 2006 volume 41, 23-29.
- Bronchial hygiene therapy (AJN) American Journal of Nursing, Jan 2002, volume 102, no.1.
- Davidson's principles and practice of medicine 20<sup>th</sup> edition, Churchill living stone, 678-679.
- Harsh mohan a text book of pathology, 5<sup>th</sup> edition, Jaypee, 485.
- Suliven, O. Physical rehabilitation, 4<sup>th</sup> edition, Jaypee, 448-469 Rehabilitation medicine, the management of physical disabilities, P.J.R Nichols, 2<sup>nd</sup> edition, page no. 263-269

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