



**EFFECT OF MULLIGAN’S MOBILIZATION WITH MOVEMENT ON THORACIC EXPANSION IN COPD PATIENTS**

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**ABSTRACT**

**Background-** The purpose of this study was to assess the effectiveness of mulligan's mobilization with movement on thoracic expansion as an adjunct to conventional treatment in COPD patients.

**Method :** 30 Subjects of COPD were included in this study. Following the data collection. Pre treatment assessment was done using incentive spirometer and inch tape measurement of chest expansion. The treatment procedure of Mulligan's mobilization with movement was performed. Post treatment assessment was done respectively.

Chest expansion measures of Axillary level, Nipple level and xiphisternal level and spirometry these outcome measures were analysed.

**Result :** The subjects were given equal treatment without dividing with the groups. Mulligan's mobilization with movement was given as an intervention to the subjects for 3 days in a week and post intervention assessment was taken. The statistical analysis was done by using in stat by paired t-test using pre and post interventional data and the results were compared. While on comparing pre post interventional values, the result between the pre and post using unpaired t-test revealed that there was statistically significant in pre and post interventional values.

**Conclusion:** From the above conducted study it concluded that a subject with mulligan's mobilization with movement on COPD patients has significant improvement clinically and statistically which improved chest expansion and spirometry score. So the study accepts the alternate hypothesis

**KEYWORDS :** COPD, Mulligan’s Mobilization with movement

**INTRODUCTION**

Chronic obstructive pulmonary disease is a lung disease characterised by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible. The more familiar terms chronic bronchitis and emphysema are no longer used, but are now included within COPD. COPD is life threatening lung disease<sup>(1)</sup> Smoking- the primary risk factor for COPD is chronic tobacco smoking. In India 80 % to 90% of cases are due to smoking<sup>(2)</sup> Occupational exposure- intense and prolonged exposure to workplace dusts found in gold mining, cotton textile and chemicals such as cadmium from welding have been involved in development of COPD. The effect occupational pollutants on the lungs appears to be less importance than the effect<sup>(3)</sup> Air pollution- studies in many countries have found that people who live in large cities have higher rate of COPD. Urban air pollution may be a contributing factor for COPD as it is thought to slow the normal growth of the lungs although the long term research need to confirm has not been done. In developing countries indoor air pollution from cooking fire smoke is common in women<sup>(4)</sup> Genetics- some factors in addition to smoke exposure is required for a person to develop COPD this factor is probably genetic susceptibility. COPD is more common among relatives of COPD patient who smoke then unrelated smokers this is thought to be mediated by auto-antibodies and auto-reactive t cells<sup>(5)</sup>

In COPD, inspiratory muscles get shortened due to hyperinflation. Chest wall mechanics get altered with chest wall rigidity setting in hyperinflation and muscle fatigue leads to hypertonicity of respiratory muscles and hypomobility of spinal, costal and sternal joints. A decrease in spine mobility is co-related with a decrease in FVC and forced expiratory volume in FEV1. There has been lack of study on effect of mulligan's mobilization with movement in improving chest expansion in COPD Subjects, therefore is study is taken up for the benefit of subject<sup>(6)</sup>.

By using manual therapy therapists are treating the pathomechanics of the joint, correction of faulty biomechanics of the joint because of which the pain was being experienced by the patient<sup>(7)</sup>. Manual therapy is considered as intense stimulation of mechanoreceptors and proprioceptors, in and around the joints, which

probably releases much stronger chemicals, which not only relieve pain but also increases the range of motion. To restore joint play, we need to deliver accessory movements by manual therapy<sup>(8)</sup>. So, with help of manual therapy provides nutrition to affected joint and also restores the joint range of motion as early as possible.<sup>(9)</sup> Hence mulligan concept is an effective, gentle, safe and satisfying way treating patient using manual therapy<sup>(10)</sup>

**MATERIAL AND METHODOLOGY**

An experimental study conducted at physiotherapy department of Krishna College of Physiotherapy. The Subjects were selected depending upon the inclusion and exclusion criteria. Informed consent was taken from the subjects. Inclusion criteria were as follows: 1) Subjects diagnosed with COPD 2) Subjects with reduced thoracic expansion 3) Subjects of age group 50-70 4) Both males and females are included. Exclusion criteria were as follows: 1) Subjects with chest trauma 2) Subjects with other lung diseases like TB, ARDS 3) Subjects with active lung infections, cystic fibrosis, lung abscess. 4) Subjects with other musculoskeletal disorders involving chest wall. The sample size in the study was 30 subjects with age group 50 to 70 years male and female included diagnosed with COPD were treated by using mulligan's MWM. The study was concluded by pre and post assessment the subjects were treated for a week each alternate day and each session was continued for 3 days a week with pre and post assessment.

**Treatment given:**

	<b>MWM for intercostal spaces.</b>	<b>MWM for costochondral joints.</b>
<b>Patients Position</b>	Horse riding position with hands on neck	Horse riding position
<b>Therapist position</b>	Standing behind the patient's body close to the patient's body, therapist knees are slightly flexed	Standing besides the patient
<b>Hand placement</b>	Therapist places ulnar aspect of his both hands in the intercoastal area bilaterally	Heel of the hand (pisiform bone) is placed under the tubercle of the desired rib to mobilize posteriorly. Pisiform of the other hand

		is placed under the costochondral joint anteriorly
<b>Mobilization</b>	Therapist lifts the respective intercostal space using the ulnar border of the palm Patient is instructed to take a deep breath/ perform offending movement	Therapist perform scooping movement with his hands to go deeper into soft tissues.  Patient is instructed to take a breath /perform offending movement.  Therapist moves his hands along the patient movement while maintaining the lift.

**STATISTICAL ANALYSIS**

**1]Age distribution**

Age groups	Subjects	Mean ±SD
50 -55 years	4	52.5 ±1.871
56-60 years	4	58±1.581
61- 65 years	6	63±1.581
66-70 years	16	68± 1.581

Age group of all the participants was between 50 to 70 years the mean age of participants ion group of 50 -55 years , 56-60 years, 61 - 65 years , 65-70 years was 52.5 ±1.871, 58±1.581, 63±1.581, 68± 1.581 respectively by using paired t test there was significant difference in mean ages of the subjects.

**2]Gender distribution**

Category	Subjects
Male	18
Female	12

30 subjects were involved in the study diagnosed with COPD which involves both male and female. There were 18 males and 12 females involved in the study

**Incentive Spirometry:**

Pre interventional mean± SD	680±76.112
Post interventional mean± SD	880±76.112
p value	< 0.0001
Interference	Extremely significant

As there was no group the paired t test was used in between pre interventional mean ± SD 680 ± 76.112 and post interventional mean ± SD 880 ±76.112 P value was < 0.0001 and interference is extremely significant.

**Chest expansion measurements**

	Axillary level	Nipple level	Xiphysternal level
Pre- test mean ±SD	74.366 ±7.82	72.83 ±7.81	72.220 ±7.905
Post- test mean ±SD	76.336±7.92	74.26±8.09	73.310 ±8.073
P value	<0.0001	<0.0001	<0.0001
Interference	Extremely significant	Extremely significant	Extremely significant

Axillary level pre-test mean ± SD was 74.83 ±7.82 &Post-test mean ± SD was 76.336 ± 7.92 P value < 0.0001 interference was extremely significant.

Nipple level pr-e test mean ± SD was 72.83 ± 7.81 & post- test mean ±SD was 74.26 ± 8.09. P value was <0.0001 interference was extremely significant

Xiphisternal level pre- test mean ±SD was 72.220 ±7.950 & post-test mean ±SD was 73.310 ±8.073 P value was <0.0001 interference was extremely significant

**DISCUSSION**

The research taken up with the aim to study the effect of mulligan's mobilization with movement on thoracic expansion in COPD patients 30 subjects diagnosed with COPD of age group 50-70 years approaching to Krishna hospital participated in the study. A thorough assessment was taken by using spirometry and chest expansion measurements at 3 levels before the application of the interventions.

The subjects were given equal treatment without dividing them into groups. Mulligan's mobilization with movement was given as an intervention to the subjects for 3 days in a week and post intervention assessment was taken.

The statistical analysis was done by using instat by paired t-test using pre and post interventional data and the results were compared.

In the study outcome measures of chest expansion in different levels were Axillary level pre-interventional value was 74.366±7.82 where- as post interventional value was 76.33±7.92. which revealed statistically extremely significant difference and improved chest expansion by paired t-test.

Nipple level pre-interventional value was 72.83±7.81 where as post interventional value was 74.26±8.09 which revealed statistically extremely significant difference and improved chest expansion by paired t-test.

Xiphisternal level pre interventional value was 72.220±7.905 where as post interventional value was 73.310 ±8.073 which revealed statistically extremely significant difference and improved chest expansion by paired t test.

The spirometric analysis is also done the results statistically revealed extremely significant difference and improved the values of spirometry and hence proved the alternative hypothesis pre interventional value was 680±76.112 where-as post interventional value was 880±76.112 by using unpaired t test.

In this study, an attempt was made to analyse the effect of Mulligan's Mobilization as an adjunct to conventional treatment in COPD Patients. Patients were given Mobilization with movement 3 days in a week to increase chest expansion.

**IMPROVEMENTS**

- 1) The postures of all subjects were corrected and mobility was better the next session.
- 2) The breathing pattern of patients were improved
- 3) The thoracic expansion was quite good in the subjects and could breath comfortably.
- 4) The measurements of chest expansion were almost near normal after the treatment.

The study was done to investigate the improvement of thoracic expansion. Its post treatment evaluation was conducted into standardized manner using incentive spirometer and chest expansion measurements in 3 levels. The result showed extremely significant improvement with mulligan's mobilization in patients with COPD.

In conclusion the result of current study showed that mulligan's mobilization has extremely significant improvement for thoracic expansion in COPD patients both statistically and clinically. We expect that mulligan's mobilization of thoracic spine gives better chest expansion in COPD patients. Further studies can be done in order to determine the long term effect of this program and evaluate this COPD Rehabilitation regimen.

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