

# Effect of Out Patient Based Pulmonary Rehabilitation in Stable Chronic Obstructive Pulmonary Disease

Dr. Sandra M<sup>1</sup>, Dr. Malavika S Kurup<sup>2</sup>, Dr. A K Abdul Khader<sup>3</sup>

<sup>1</sup>Postgraduate Student, Department of Respiratory Medicine, KMCT Medical College Manassery, Kozhikode, Kerala, India  
Corresponding Author Mobile No.8281529396

<sup>2</sup>Postgraduate Student, Department of Respiratory Medicine, KMCT Medical College Manassery, Kozhikode, Kerala, India  
Mobile No.7907269038

<sup>3</sup>Professor, Department of Respiratory Medicine, KMCT Medical College Manassery, Kozhikode, Kerala, India  
Mobile No.9447034885

**Abstract:** ***Introduction:** Chronic obstructive pulmonary disease (COPD) is one of the top three causes of death worldwide (1). Since COPD is a chronic and progressive disease it produces health related problems as well as economic and social burden to patients and families. So, the management of COPD values more. In these patients, exercise capacity, health - related quality of life and participation in daily activities are often impaired out of proportion to lung function impairment (2). Pulmonary rehabilitation is a foremost intervention for the management of COPD. Pulmonary rehabilitation is not frequently included in the integrated care of patients and is often inaccessible to patients. Our aim is to assess the impact of pulmonary rehabilitation on exercise capacity (6MWT), and quality of life in COPD. **Materials and Methods:** 60 patients of age group 40 - 80 years who are diagnosed with COPD as per GOLD guidelines and who met the inclusion criteria were included in this study. Detailed evaluation was done. Pulmonary rehabilitation offered patient education, breathing exercises, chest physiotherapy, and exercise training. 6 MWT, Spirometry (FEV1), SGRQ, BORG dyspnoea scale was assessed initially and after 12 weeks of the programme. **Results:** % of sample population were males and 33.3% were females. The mean age of the population was 68.7 years. Pulmonary rehabilitation program for 3 months was associated with statistically significant ( $p < 0.05$ ) and clinically relevant improvement in physical performance in the study group. The mean improvement in 6MWT was 57 meters. Quality of life which was measured by the SGRQ score improved by more than 10 points,  $p$  value of  $< 0.05$ . **Conclusion:** The results of the present study clearly demonstrate that pulmonary rehabilitation play a definite role in the management of COPD patients. In our study, outpatient based pulmonary rehabilitation resulted in significant improvement in exercise tolerance and quality of life. Hence Outpatient based pulmonary rehabilitation has to be offered to moderate to severe COPD Patients. Also the concomitant treatment of both arteriovenous disease showed significant benefits in healing and overall outcome of the patient.*

**Keywords:** Pulmonary Rehabilitation, COPD, Quality of Life, 6MWT

## 1. Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a heterogeneous lung condition characterized by chronic respiratory symptoms (dyspnoea, cough, sputum production, exacerbations) due to abnormalities of the airways (bronchitis, bronchiolitis) and/or alveoli (emphysema) that cause persistent, often progressive, airflow obstruction (1). COPD is strongly associated with impaired exercise performance and functional capacity. As the airflow obstruction progresses, COPD patients typically become increasingly sedentary, leading to muscular and cardiovascular deconditioning. The exercise capacity, quality of life (QoL) and participation in activities of daily living are often impaired out of proportion to the lung function impairment. (1)

## 2. Materials and Methods

This is prospective observational study conducted at the Department of Respiratory Medicine, KMCT Medical College during the period 2020 - 2021. After approval from the ethical committee and obtaining informed written consent from each patient, 60 patients of age group 40 - 80 years who are diagnosed with COPD as per GOLD

guidelines and who met the inclusion criteria (Between the age of 55 to 80 years, who attended our pulmonary rehabilitation programme for 12 weeks) were included in this study. Patients with significant orthopedic, cardiovascular, neurological comorbidities and with hemodynamic instability were excluded from the study. Detailed evaluation was done. Pulmonary rehabilitation offered patient education, breathing exercises, chest physiotherapy, and exercise training. 6MWT, SGRQ, was assessed initially and after 12 weeks of the programme. After collecting the data, it was entered into computer, and was analyzed by SPSS statistical package. Necessary statistical tables were constructed along with charts and diagrams. Categorical and quantitative variables were expressed as frequency (percentage) and mean  $\pm$ SD respectively. Paired t test was used to compare the effect of outpatient based pulmonary rehabilitation on exercise capacity, dyspnea and quality of life in stable COPD patients. For all statistical interpretations,  $p < 0.05$  was considered the threshold for statistical significance. Statistical analysis were performed by using a statistical software package SPSS version.

Volume 12 Issue 6, June 2023

[www.ijsr.net](http://www.ijsr.net)

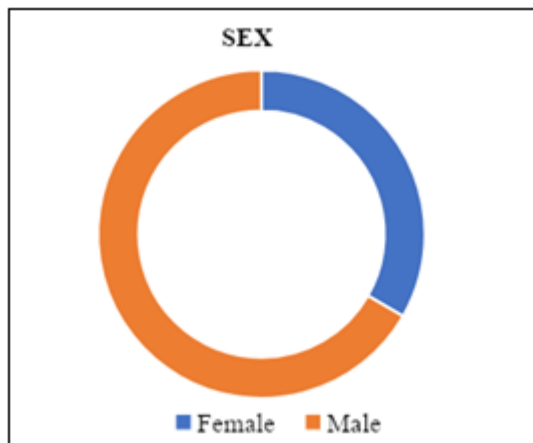
Licensed Under Creative Commons Attribution CC BY

### 3. Observations and Results

All 60 patients completed the study and were available for data analysis. Demographic parameter data is represented below:

**Table 1:** Gender distribution

Sex	Frequency	Percent
Female	20	33.3
Male	40	66.7
Total	60	100.0



**Figure 1:** Gender distribution

### Comparison between pre and post pulmonary rehabilitation parameters

The various tests used to assess the efficiency of pulmonary rehabilitation program was compared using paired t tests

**Table 3:** Paired sample test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreRb 6MWT	253.95	60	98.053	12.659
	PostRb 6MWT	310.05	60	110.793	14.303
Pair 2	PreRb SGRQ	80.55	60	38.845	5.015
	PostRb SGRQ	69.97	60	40.640	5.247

Paired Samples Correlations:

**Table 4:** Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	PreRb 6MWT & PostRb 6MWT	60	.955	.000
Pair 2	PreRb SGRQ & PostRb SGRQ	60	.993	.000

**Table 5:** Paired Samples Test

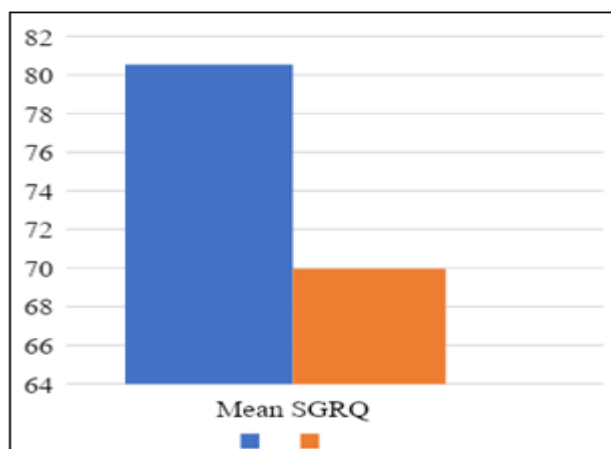
		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference
		Lower			
Pair 1	PreRb 6MWT - PostRb 6MWT	- 56.100	33.794	4.363	- 64.830
Pair 2	PreRb SGRQ - PostRb SGRQ	10.583	5.053	.652	9.278

**Table 6:** Paired Samples Test

		Paired Differences		t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference				
		Upper				
Pair 1	PreRb 6MWT - PostRb 6MWT	- 47.370		- 12.859	59	.000
Pair 2	PreRb SGRQ - PostRb SGRQ	11.889		16.223	59	.000



**Figure 2:** Change in 6MWT



**Figure 3:** Change in SGRQ Score

The mean 6 - minute walk test value changed from 253.95 m to 310.05 m after pulmonary rehabilitation the result was significant at a p value of < 0.05

St George's Respiratory Questionnaire score (SGRQ) dropped significantly from the pre pulmonary rehabilitation value of 80.55 to 69.97 post rehabilitation. The finding was

significant at a p value of  $< 0.05$

#### 4. Discussion

Chronic obstructive pulmonary disease (COPD) is a common disease and a common cause of mortality and morbidity (3). Exercise intolerance is a characteristic and a troubling manifestation of this disease. Loss of physical capacity and the adverse psychological effects of COPD contribute greatly to morbidity. Medicines have limited role in improving physical capacity of these patients. People suffering from severe forms of this disease usually spend their remaining years of life in bed and have declining quality of life. Chronic obstructive pulmonary disease (COPD) is a common disease and a common cause of mortality and morbidity (4). Exercise intolerance is a characteristic and a troubling manifestation of this disease. Loss of physical capacity and the adverse psychological effects of COPD contribute greatly to morbidity. Medicines have limited role in improving physical capacity of these patients. People suffering from severe forms of this disease usually spend their remaining years of life in bed and have declining quality. In this prospective study done in patients with COPD over a period of 12 months a total of 60 patients who met the criteria were screened. All these patients had moderate to severe pulmonary impairment with markedly reduced exercise tolerance and quality of life with optimum medical management. 66.7% of sample population were males and 33.3% were females. C. Raheison (5), et al has reported that COPD affects twice as many males as females, a finding similar to the present results. The mean age of the population was 68.7 years with participants as young as 61 years to 81 years included. Similar finding was reported by K E holm (6) et al where the age range was broad from 32 years to 84 years. Pulmonary rehabilitation program for 3 months was associated with statistically significant ( $p < 0.05$ ) and clinically clinically relevant improvement in physical performance in the study group. The mean improvement in 6MWT was 57 meters, A finding reflected in the study by Rainer Gloeckl (7) et al where the change was + 44 meters. Shahin Barakat (8) et al, in 2008 France there was a mean increase in 6MWD of more than 54 m in the rehabilitation group after 14 weeks, which was significantly greater than the mean change in the control group ( $p < 0.05$ ). The SGRQ score improved by more than 10 points which was consistent with the meta-analysis findings where the SGRQ score was reported in 25 studies when Pulmonary rehabilitation showed a significant improvement in the quality of life according to the altered SGRQ total score (WMD, -6.66; 95% CI: -8.38 to -4.94;  $p < 0.001$ ; I<sup>2</sup> = 78%). Virendra Singh (9) et al in Jaipur 2001 following a 4 week pulmonary rehabilitation demonstrated a significant increase in 6MWD with a P value  $< 0.001$ .

Our study has demonstrated a statistically significant improvement in exercise tolerance and QoL following an outpatient based PRP. This study is consistent with previous reports, " (9, 8, 10) showing that a PRP for COPD patients encompassing education, breathing retraining, and chest physiotherapy followed by exercise training leads to functional exercise capacity, and health related quality of life. The improvement in exercise tolerance and quality of life following an outpatient based PRP can be ascribed to

aerobic capacity of muscle strength, increased motivation, increased adherence to treatment, desensitization to sensation of dyspnoea, improved ventilatory muscle function and improved technique of performance.

#### 5. Conclusion

Looking at the increasing burden of COPD patients in developing countries, there is an urgent need of advocacy of pulmonary rehabilitation in complete management of this disease. Despite its proven effectiveness and the strong scientific recommendations for its routine use in the care of COPD, Pulmonary rehabilitation is generally underutilized and strategies for increasing access to rehabilitation services are needed. The present study, demonstrates that simple outpatient based pulmonary rehabilitation in a tertiary care hospital resulted in significant improvement in Quality of life, exercise capacity, after pulmonary rehabilitation programme. The overall benefits of outpatient Pulmonary rehabilitation programme takes into consideration - optimization of and improved adherence to the medical regimen, smoking cessation, the educational component and increased frequency of interaction with health - care providers.

#### References

- [1] Global Initiative for Chronic Obstructive Lung Disease. Global strategy for diagnosis, management, and prevention of chronic obstructive lung disease 2023 report, Available from: <http://www.goldcopd.org>.
- [2] Hamilton AL, Killian KJ, Summers E, Jones NL. Symptom intensity and subjective limitation to exercise in patients with cardiorespiratory disorders. *Chest* 1996; 110: 1255 - 63.
- [3] Survey of causes of death in rural India. Registrar General of India, Ministry of Smith K, Cook D, Guyatt GH, Madhavan J, and Oxman AD. "Respiratory muscle training in chronic airflow obstruction". *Am. Rev. Respir. Dis.* 1992; 145: 533 - 539.
- [4] Virendhra singh Pulmonary rehabilitation in patients with COPD, *The Indian journal of chest diseases and allied sciences*, 2003 vol 45. Raheison C,
- [5] Holm, Kristen E et al. "The impact of age on outcomes in chronic obstructive pulmonary disease differs by relationship status." *Journal of behavioral me*
- [6] Gloeckl R, Schneeberger T, Jarosch I, Kenn K. Pulmonary Rehabilitation and Exercise Training in Chronic Obstructive Pulmonary Disease. *Dtsch ArzteblInt.* 2018 Feb. 1340
- [7] Shahin Barakat Outpatient pulmonary rehabilitation in patients with chronic obstructive pulmonary disease. *International Journal of COPD.* 2008 (1): 155–62. v
- [8] Ries AL, Bauldoff GS, Carlin B, et al. Pulmonary rehabilitation: joint ACCP/AACVPR Evidence - Based clinical practice guidelines. *Chest.* 2007; 131 (5): 4S–42S. .
- [9] A simple pulmonary rehabilitation program improves health outcomes and reduces hospital utilization in patients with COPD Kok P Hui 1, Alison B Hewitt.