

ORIGINAL RESEARCH

Pulmonary rehabilitation in COPD: Comparison of health related quality of life

¹Dr.Vijay Shettar, ²DrJaveriyaMohammadi, ³DrSivasankari R, ⁴Dr.Aishwarya C

¹Pulmonologist, Assistant professor, VIMS, Ballari, Karnataka, India

²Pulmonologist, Assistant professor, Dr B R Ambedkar Medical College , Bangalore, Karnataka, India

³Pulmonologist, Senior Resident, Dr B R Ambedkar Medical College, Bangalore, Karnataka, India

⁴Pulmonologist, Assistant professor, Dr B R Ambedkar Medical College, Bangalore, Karnataka, India

Corresponding Author

Dr.VijayShettar

Pulmonologist, Assistant professor, VIMS, Ballari, Karnataka, India

Received: 12March, 2023

Accepted: 18April, 2023

ABSTRACT

Pulmonary rehabilitation is one of the non-pharmacological modality of treatment for COPD. It improves symptoms, quality of life, exercise performance, health care utilization and reduces future exacerbations in patients with COPD. HRQoL of the patient was assessed using the St. George's Respiratory Questionnaire (SGRQ) version- 2.3. The responses to its 50 items were aggregated into an overall score and three sub scores for symptoms, activity, and impact. A change of four units or more was accepted as significant. Between two groups comparison, there was statistical significant difference (P .001) seen in pre and post difference in SGRQ i.e. SGRQ score revealed a significant reduction in intervention group (3.97) compared to control group (0.84).

Keywords: Pulmonary rehabilitation, COPD, health related quality of life

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Introduction

COPD represents an important public health problem that is both preventable and treatable characterized by persistent expiratory airflow limitation. It is the chronic inflammatory and multi systemic disease. It is a major cause of chronic morbidity and mortality throughout the world.¹

Chronic obstructive pulmonary disease (COPD) exacerbations have a major impact on the course of disease that worsens symptoms, lung function, quality of life leading to increased morbidity and mortality. COPD is currently the fourth leading cause of death in the world.¹ It is projected to be the 3rd leading cause of death by 2020.²

Pulmonary rehabilitation is one of the non-pharmacological modality of treatment for COPD. It improves symptoms, quality of life, exercise performance, health care utilization and reduces future exacerbations in patients with COPD.³

It is defined by the American Thoracic Society and the European Respiratory Society as a "comprehensive intervention based on a thorough

patient assessment followed by patient-tailored therapies that include, but are not limited to, exercise training, education, and behaviour change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviors"⁴

Pulmonary rehabilitation programs generally include patient assessment, exercise training, education (especially involving collaborative self-management strategies), nutritional intervention, psychosocial support, as well as discussion of advance directives. Smoking cessation, breathing retraining, chest physical therapy, oxygen therapy, and adjunctive therapies are also given to selected individuals. Its multidisciplinary approach which gets contributions from different health care professional which includes physicians, nurses, nurse practitioners, physical therapists, respiratory therapists, nutritionists, or occupational therapists may be involved in a particular program, depending on availability and resources.^{5,6}

Methodology

- Patients were recruited from department of Respiratory medicine admitted with acute exacerbation of COPD
- Detailed clinical history and complete clinical examination was done
- Appropriate investigations were done (Complete haemogram, Blood sugar, Electrolytes, Chest x ray, Arterial blood gas analysis, Sputum for gram stain and culture and sensitivity, ECG, PFT at time of discharge)
- 60 patients were recruited for the study on the basis of inclusion and exclusion criteria and randomized into two groups (Interventional and Control group)
- A written informed consent was obtained from the patient
- Patients were treated according to GOLD (global initiative for chronic obstructive lung disease) 2016 guidelines. Interventional group received pulmonary rehabilitation in addition to usual care, two to three sessions daily of 20-30 minutes duration each session, from third day to tenth day/discharge whichever was latest. Pulmonary rehabilitation included education, psychological support, following exercises. Control group received only usual care.

Sample size: A sample size of 60 patients (30 interventional and 30 control) were taken by using single proportion- absolute precision method

Type of study: Prospective interventional study

Inclusion Criteria

- COPD Stage 2 to Stage 4 according to GOLD 2016 guidelines
- Either gender
- Age >40yrs
- Willing to give informed written consent

Exclusion Criteria

- Patients with persistent sepsis
- Patients with unstable angina, recent myocardial infarction, Congestive cardiac failure
- Haemoglobin < 10gm/dl
- Patients with tuberculosis/lung cancer
- H/O atopy
- Cognitive impairment
- Severe neurological disease
- Disabling Arthritis

Health-related QoL (HRQoL): HRQoL of the patient was assessed using the St. George’s Respiratory Questionnaire (SGRQ) version- 2.3. The responses to its 50 items were aggregated into an overall score and three sub scores for symptoms, activity, and impact. A change of four units or more was accepted as significant

Results

Table 1: Table showing group statistics of pre and post difference in SGRQ between cases and controls

Group Statistics					P value	
Groups	N	Mean	Std. Deviation	Std. Error Mean	.001	
DIFFSGRQ	Cases	30	3.9653	4.32182		.78905
	Controls	30	.8403	1.76526		.32229

Table 2: Table showing pre and post difference of SGRQ between cases and controls

	Pre & Post Difference in SGRQ(points)
Cases	3.97
Controls	0.84

Between two groups comparison, there was statistical significant difference (P<.001) seen in pre and post difference in SGRQ i.e. SGRQ score revealed a significant reduction in intervention group (3.97) compared to control group (0.84)

Table 3: Table showing statistics of pre and post SGRQ among cases

Paired Samples Statistics					P value	
		N	Mean	Std.Deviation	Std. Error Mean	.0005
Pair 2	SGRQ PRE	30	74.7143	10.93427	1.99632	
	SGRQ POST	30	70.7490	11.09569	2.02579	

Table 4: Table showing statistics of pre and post SGRQ among controls

Paired Samples Statistics					P value
	N	Mean	Std. Deviation	Std. Error Mean	
Pair 2	SGRQ Pre	30	68.1563	11.73171	.014
	SGRQ Post	30	67.3160	10.78501	

Table 5: table showing pre and post SGRQ values among cases and controls

SGRQ	Pre	Post
Cases	74.7	70.7
Controls	68.2	67.3

Within group comparison, there was highly statistical significant difference seen in intervention group (P<.0005) compared to baseline than in control group (P<.014).

Discussion

In my study among 60 COPD patients, 30 were in intervention group and 30 in control group. Intervention group received pulmonary rehabilitation along with usual care. Control group received only usual care.

In my study, rehabilitation was started from 3rd day till 10th day/discharge whichever was latest for a minimum of 7 days and continued at home after discharge. In the present study, most of them were smokers and equally distributed among intervention and control groups. Most of them were in group B and C as per combined COPD assessment group (GOLD) PR was designed by integrating the opinion of various specialists and considering the pathological mechanisms of AECOPD. PR was done as per pulmonary rehabilitation protocol in ERS/ATS guidelines which included education on (disease awareness, medication, nutrition), psychological support, sputum clearance treatments and exercises as per protocol. The intensity of exercises implemented was based on general condition and severity of patient's disease.^{7,8}

Results showed that pulmonary rehabilitation in peri exacerbation period alleviated dyspnoea, there was a significant improvement in six minute walk distance and a significant reduction in SGRQ score in intervention group compared to control group. Cough with expectoration improved (decreased) more in intervention group than control group as intervention group received chest physiotherapy.⁹

Within group: In intervention group, there was significant improvement in dyspnoea, 6MWD and SGRQ score compared to baseline. In control group, improvement was there compared to baseline, but not as significant as in intervention group.

Lin-Yu Liao *et al*, in 2015, conducted a study on efficacy of a respiratory rehabilitation exercise training package on 61 elderly hospitalized patients with acute exacerbation of COPD. In this study, 30 were in experimental and 31 in control group. Experimental group received respiratory rehabilitation exercise training twice a day, 10-30 minutes per

session for 4 days and clinical parameters (dyspnoea, cough, exercise tolerance, and sputum expectoration) were assessed at the baseline and at the end of the fourth day. Results suggested that the respiratory rehabilitation reduced

symptoms and enhanced the effectiveness of the care of elderly inpatients with AECOPD.¹⁰

My study findings were similar to that of above study done by Lin-Yu Liao *et al*. In the above study PR was given for 4 days but in my study it was for minimum of 7 days. My study additionally included quality of life as other parameter which was not included in above study.

Conclusion

The present study concludes that pulmonary rehabilitation in peri exacerbation period of COPD patients reduces dyspnoea, increases exercise tolerance and improves health related quality of life. Therefore pulmonary rehabilitation should be started as early as possible in hospitalised AECOPD patients and to be continued at home.

References

1. Kohansal R, Martinez-Cambor P, Agusti A, *et al*. The natural history of chronic airflow obstruction revisited: an analysis of the Framingham offspring cohort. *Am J Respir Crit Care Med*.2009;180(1):3-10.
2. Raad D, Gaddam S, Schunemann HJ, *et al*. effects of water-pipe smoking on lung infection: a systematic review and meta-analysis. *Chest*. 2011;139(4):764-74.
3. Tan WC, Lo C, Jong A, *et al*. Marijuana and chronic obstructive lung disease: a population based study. *CMAJ*. 2009;180(8):814-20.
4. Yin P, Jiang CQ, Cheng KK, *et al*. Passive smoking exposure and risk of COPD among adults in China: the Guangzhou Biobank cohort study. *Lancet*. 2007;370(9589):751-7.
5. Stoller JK, Aboussouan LS. Alpha 1 –antitrypsin deficiency. *Lancet*. 2005;365(9478):2225-36.
6. Mercado N, Ito K, Barnes PJ. Accelerated ageing of the lung in COPD: new concepts. *Thorax*. 2015;70(5):482-9.
7. Arbex MA, De Souza Conceição GM, *et al*. Urban air pollution and chronic obstructive pulmonary disease-related emergency department

- visits. J Epidemiology Community Health. 2009;63(10):777-83.
8. Beran D, Zar HJ, Perrin C, Menezes AM, Burney P. Burden of asthma and chronic obstructive pulmonary disease and access to essential medicines in low-income and middle-income countries. The Lancet respiratory medicine. 2015;3(2):159-70.
 9. Silva GE, Sherill DL, Guerra S, Barbee RA. Asthma as a risk factor for COPD in a longitudinal study. Chest. 2004;126(1):59-65.
 10. Lin-Yu, Kuei-Min Chen,*et al.* Efficacy of a respiratory rehabilitation exercise training package in hospitalized elderly patients with acute exacerbation of COPD: a randomized control trial. International Journal of COPD. 2015;10:1703-1709.