

Effectiveness of Chest Physical Therapy in Improving Quality of Life and Reducing Patient Hospital Stay in Chronic Obstructive Pulmonary Disease

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ABSTRACT

Objective: To find out the effectiveness of chest physical therapy along with standard medical treatment versus standard medical treatment alone in improving quality of life and reducing patient's hospital stay in Chronic Obstructive Pulmonary Disease (COPD) patients.

Methods: A randomized controlled trial was conducted in a tertiary care hospital of Peshawar, from September 2016 to February 2017. Thirty COPD patients were included in the study. All patients were randomized into control group and experimental group. The experimental group received chest physical therapy along with standard medical treatment while control group received standard medical treatment alone.

Results: The mean age of the participants was 54.2 ± 7.2 years. Both groups were similar with respect to age (p-value 0.432) and gender distribution (p-value 0.464). At baseline mean Saint George's respiratory questionnaire (SGRQ) score was 38.1 ± 7.3 for control group while 37.9 ± 9.2 for experimental group (p-value 0.947). The post-treatment mean SGRQ score was 34.6 ± 6.5 for control group while 28.1 ± 8.7 for experimental group with p-value 0.028. The mean hospital stay of control group was 9.26 ± 1.43 days while mean hospital stay of experimental group was 8.20 ± 1.47 days (p-value 0.055).

Conclusion: Chest physical therapy combined with standard medical treatment has considerable effect on improving functional status and quality of life of COPD patients. Yet the effect of chest physical therapy in reducing hospital stay in COPD patients is insignificant.

Key words: Chronic obstructive pulmonary disease, chest physical therapy, quality of life

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INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is one of the leading cause of the death.¹ Globally, the prevalence of COPD in men aged 30 years or more was 14.3% while in women was 7.6%.² The cost of COPD is estimated to about £ 491M per year.³ Due to the increase in the prevalence of COPD, chest physical therapy has received much attention.⁴ This is reflected by the findings of various previous studies which have supported the effectiveness of chest physical therapy in COPD patients.⁵⁻⁷

Several treatment options are in use nowadays in the management of COPD, however optimal treatment intervention was not being agreed.⁸⁻¹⁰

Chest Physical therapy techniques e.g. active cycle of breathing, percussions, vibrations and postural drainage are commonly used in patients with respiratory problems. Similarly, pharmacological interventions including bronchodilators are commonly prescribed in outpatient departments and pulmonology wards for the management of COPD patients.

Although, ample studies available that suggests that both the physical therapy and medical treatment are effective in the management of COPD.^{8,11-13} However, studies comparing the effectiveness of physical therapy versus standard medical treatment in promoting quality of life and reducing hospital stay of patients with COPD are scarce. Therefore, we have conducted this study to determine efficacy of chest physical therapy and standard medical treatment versus standard medical treatment alone in promoting quality of life and reducing hospital stay of patients with COPD.

METHODS

This Randomized Controlled Trial (RCT) was conducted in a tertiary care hospital of Peshawar from September 2016 to February 2017. Ethical approval was obtained from ethics committee of KMU Institute of Physical Medicine and Rehabilitation. The purpose and procedure of the study were explained to all patients who fulfilled the eligibility criteria. Informed consent was also obtained from those who were willing to participate.

The inclusion criterion for the study was admitted patients with stage 2 COPD in pulmonology ward, both male and female, with age between 40-70 years. Patients with diagnosis of pneumothorax, congestive heart failure, recent surgery and other co-morbidities were excluded.

The Saint George's respiratory questionnaire (SGRQ)¹³ was used both at baseline and post treatment to evaluate the functional status and quality of life of COPD patient. Patient's hospital stay was measured in days from the date of

admission to the date of discharge.

Thirty brown envelopes containing consent form, demographic information sheet and data collection tools were numbered with 15 labeled as 'control group' and other 15 labeled as 'experimental group'. These envelopes were put in a box in such a manner that labeling of these envelopes were hidden. Participants of the study were asked to pick one envelope for putting them into either into control group or experimental group.

Patients in Control Group received only Standard Medical treatment. The treatment was according to general protocols of our institute followed by pulmonology ward. On the day of admission till the date of discharge, these patients were kept under observation. No physical therapy intervention or guidance was provided to these patients. On the other hand, patients in Experimental Group received chest physical therapy along with medical treatment. The medical treatment was according to general protocols followed by pulmonology ward.

Chest physical therapy was consisted of pursed lip breathing techniques, chest expansion exercises, deep breathing exercises, active cycle of breathing technique, use of tri-flow and general chest care guidance provided by physiotherapist. Deep breathing exercises were consisted of deep forceful inhalation and exhalation. Active cycles of breathing technique were consisted of maximal inhalation followed by huff and cough and the cycle was repeated. Patients in experimental group received 2 sessions of chest physical therapy per day, with each session lasting from 30-45 minutes.^{8,11-13} All patients in this group received these maneuvers from the day of admission to the day of discharge.

The data were analyzed through Statistical Package for Social Sciences (SPSS) version 23. Interventions were labeled as "Independent Variables" while functional status and patient's hospital stay were labeled as "Dependent Variables". Descriptive statistics were used in terms of frequencies and percentages while Independent t-test was used to see the difference in between group.

RESULTS

There were total 30 patients, 15 in control group while 15 in experimental group. The mean age of the participants was 54.2 ± 7.2 . There were 16 (53.3%) male and 14 (46.7%) female participants. The control group and experimental group were similar with respect to age (p-value 0.432) and gender distribution (p-value 0.464). (Table 1) At baseline mean SGRQ score was 38.1 ± 7.3 for control while 37.9 ± 9.2 for experimental group (P-value 0.947). However, post-treatment mean SGRQ score was 34.6 ± 6.5 for control group while 28.1 ± 8.7 for experimental group with p-value 0.028, which shows significant improvement in experimental group with respect to SGRQ scores. The mean hospital stay of control group was 9.26 ± 1.43 days while mean hospital stay of EG was 8.20 ± 1.47 days (p-value 0.055). (Table 2 & 3)

Table 1: Demographic characteristics of the patients (n=30)

	CG	EG	p-value
Age	55.3 ± 7.6	53.2 ± 6.8	0.432
Gender			
Male	9 (60.0%)	7 (46.7%)	0.464
Female	6 (40.0%)	8 (53.3%)	

CG: Control Group, EG: Experimental Group

Table 2: Comparison of the pre-treatment SGRQ scores (n=30)

	CG	EG	p-value
SGRQ score	38.1 ± 7.3	37.9 ± 9.2	0.947

CG: Control Group, EG: Experimental Group, SGRQ: Saint George's respiratory questionnaire

Table 3: Comparison of the post treatment SGRQ scores and mean hospital stay between groups

	CG	EG	p-value
SGRQ score	34.6 ± 6.5	28.1 ± 8.7	0.028
Mean hospital stay	9.26 ± 1.43	8.20 ± 1.47	0.055

CG: Control Group, EG: Experimental Group

DISCUSSION

Chest physical therapy is commonly used intervention in patients with airway conditions.^{6,15,16} Previous studies reported that pulmonary rehabilitation is effective in improving endurance and minimizing complications in COPD patients.^{17,18}

Nevertheless, there is limited literature available which reported effectiveness of chest physical therapy in promoting Quality of life and reducing patient hospital stay in COPD patients.

In current study, both groups were similar with respect to age and gender distribution and SGRQ score at baseline. However, analysis of post treatment shows significant improvement in experimental group as compared to control group in respect to SGRQ score which indicates that chest physical therapy combined with standard medical treatment has more beneficial effects in improving functional status including decrease in pain and improvement in activities of daily living and quality of life as compared to standard medical treatment alone. These results are consistent with literature. It is reported that for symptomatic COPD patients, chest physical therapy is significant in terms of improving functional status.¹⁹ Similarly previous studies also showed that exercise regime improves quality of life in COPD patients.⁸ The reason behind it may be that chest exercises not only improves breathing pattern but also strengthen chest muscles.²⁰

Hospital stay is directly associated with physical, psychological and financial burden of the disease on patient, his/her family and society.²¹ Due to long stay of COPD patient in hospitals, COPD is considered one of the costly diseases and places huge burden on health care services.²² Though majority of previous studies reported that chest physical therapy reduces hospital stay in COPD patients.^{6,8,10} Yet, results of current study showed that there was only marginally significant difference in the hospital stay of participants in control and experimental group, which suggests that chest physical therapy may not be an effective toll in reducing hospital stay in COPD patients.

CONCLUSION

Chest physical therapy combined with standard treatment has significant effect on improving functional status and quality of life of COPD patients. Yet the effect of chest physical therapy in reducing hospital stay in COPD patients is marginally significant.

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