Original Article

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Prevalence of Balance Deficits in Chronic Obstructive Pulmonary Disease

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Abstract

Background: Although primary path physiology of COPD is pulmonary but extra pulmonary manifestation like skeletal muscles dysfunction, physical capacity etc. are studied. Preliminary Evidence shows deficit in postural control in COPD. We aimed at finding out prevalence of balance deficits in chronic Obstructive pulmonary disease (COPD), little is known regarding the disordered subcomponents underlying control of balance. **Objective:** To find out the prevalence of balance deficit in patients with Chronic Obstructive Pulmonary disease. **Participants :** 100 subjects (96 male and 4 female) with COPD participated in this study. **Methods:** A observational study design was used. Subjects aged between 40-60 years were recruited for study. Balance was evaluating using the Berg Balance Scale; Timed Up and Go Test and Sit and Reach Test. Socioeconomic status was assessed by Kuppuswamy Scale. **Results:** According to Berg Balance Scale 67% had medium fall risk and 33% had low fall risk. As per Timed Up and Go Test 65% had high risk of falls. Berg Balance Scores and Timed Up and Go Test had a significant correlation (p= .000 ;p < 0.05). Berg Balance Scores and Timed Up and Go Test score had significant correlation with FEV_1(r=0.195,p=0.051); (r=0.218,p=0.029). **Conclusion:** In conclusion , this study showed that a majority of Chronic Obstructive pulmonary Disease patients have balance issues.

Keywords: Chronic obstructive pulmonary disease; Berg balance scale; Timed up and go test; Sit and reach test; Kuppuswamy scale.

Introduction

Chronic obstructive pulmonary disease (COPD) is a preventable and treatable disease with some significant extra pulmonary effects that may contribute to the severity in individual patients. Its pulmonary component is characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lung to noxious particles or gases.[1]

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The prevalence rates of COPD in males varied from 2.12% to 9.4% in studies conducted in north India. The respective ranges for females are 4.3% and male is 7.0% in Delhi. The median values of these prevalence rates are 5% for males and 2.7% for females. The prevalence rate New Delhi is 8.1% for males and 4.6 % for females.[26] Thus, COPD is more common among males than females.]26,27,28,29,30]

The ability to maintain balance is critical for mobility, avoidance of falls and functional independence in daily living. Balance impairment has been associated with an increased risk of falls and emerging evidence suggest that balance may effected in COPD. The primary path physiology of COPD is pulmonary but extra pulmonary manifestation of the disease is also well studied.

Thus this study aims to find out prevalence of balance deficits in COPD patients aged between 40-60 years.

Methods

Participants

An observational design was used. All COPD patients were included who met the following: COPD diagnosed as GOLD's criteria, Age between 40-60 years, independent ambulation and independent in activity of daily living. Patients with any diagnosed musculoskeletal; neurological; psychiatric and cognitive problems, severe visual and hearing deficit and pulmonary disorder other than COPD were excluded.

Data Collection Procedure

The study was reviewed; discussed and approved by Research committee and Institutional ethical committee of LRS Institute of Tuberculosis and Respiratory diseases. Subjects were recruited from LRS Institute of Tuberculosis and Respiratory disease, from September 2012 onwards. After obtaining written consent from patients, Berg Balance Scale, Timed Up and Go Test and Sit and Reach Test was performed .

Measures

Berg Balance Scale (BBS)

The BBS was developed as a performance-oriented measure of balance in elderly individuals.[14] The BBS consists of 14 items that are scored on a scale of 0 to 4. A score of 0 is given if the participant is unable to do the task, and a score of 4 is given if the participant is able to complete the task based on the criterion that has been assigned to it.[24] The maximum total score on the test is 56. The items include simple mobility tasks (e.g. transfers, standing unsupported, sit-to-stand) and more difficult tasks (e.g., tandem standing, turning 360°, single-leg stance). Some task are rated according to the quality of the performance of the task; where as the time taken to complete the task is measured for other tasks.[24]

Timed Up and Go Test

The TUG measures the time it takes a subject to stand up from an armchair, walk a distance of 3m, turn, walk back to the chair, and sit down.[26,24]

Sit and Reach Test

The sit and reach (SR) test is a ûeld test used to measure hamstring and low back flexibility.[49]

Kuppuswamy Scale

Kuppuswamy's socioeconomic status scale has been in use as an important aid to measure Socioeconomic status of families in urban communities. The original 1976 version has been Updated by Mishra and Singh in 2003 and Kumar *et al* in 2007. The last update was done and published in public domain in 2007. The latest update; and may be applicable in the studies ongoing in 2012.

Statistical Analysis

Data Analysis

Statistical analyses were performed using SPSS (Statistical Package for Social Sciences; version 17.0 for Windows). Descriptive statistical methods were used to analyses the data. To determine correlation between two measures Spearman's correlation were used. Level of significance was set at $p < 0.05$.

Results

100 subjects participated in study. Out of 100, 96 were male and 4 were female with mean age 53 + 6.07 and 57.75 +2.8 respectively. (Table-1)

Smoking History

The smoking years of the sample is 19.95+8.20 years. Mean smoking years of male