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The effect of physiotherapy management in fear of falls in patient with chronic obstructive pulmonary disease (COPD): A case report

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Abstract

In chronic obstructive pulmonary disease, patients having breathing issues more than balance issues are seen, but in this case fear of fall is seen because of reduced physical capacity and social isolation. Due to reduced physical function physical capacity is reduced and exercise tolerance is reduced. 10 minutes of aerobic exercises (bicycling and treadmill walking) and balance training in uneven surface if done for 6 weeks. Six-minute walk test and for balance berg balance scale is used to evaluate. There is an improvement in berg balance scale and also in 6-minute walk test.

Keywords: chronic obstructive pulmonary disease, physiotherapy, balance, fear of fall, aerobic exercise

Introduction

Falls in the older adults are a major health problem. One third of adults aged over 65 years and living in a community experience a fall annually, which can have significant physical consequences including injuries, hospitalization and increased mortality. Falls may also have important psychological consequences leading to an increase fear of fall in older adults.

While this fear is more prevalent among people with advanced age and a prior fall history, it also present in those who have not experienced prior falls. Preliminary evidence suggests an increased fear of falls among people with chronic obstructive pulmonary disease compared to those in the general elderly population. Increased fear of falls in the elderly has been associated with impaired physical function, social isolation and decreased balance and reduced exercise capacity^[3].

Chronic obstructive pulmonary disease represents an important health issue worldwide, with estimates predicting it to be the third leading cause of death by the year 2030. Because of the higher life expectancy observed in developed countries, the population of older adults with COPD continues to rise. The multisystem involvement of COPD causes a broad range of functional limitations, and emerging evidence demonstrates that older adults with COPD have deficits in postural control and an increased fear of falling compared with their healthy peers. Both impaired postural control and increased fear of falling are established falls risk factors in community dwelling adults without lung disease. The consequences of these factors include activity avoidance, depression, reduced activities of daily living, isolation, and decreased health-related quality of life. These are all highly important outcomes frequently targeted for improvement in the management of COPD^[1].

COPD is a respiratory disease that results in progressive airflow limitation and respiratory distress. In addition to the pulmonary pathology, patients with COPD develop other manifestations of the disease such as cardiovascular comorbidities, peripheral muscle dysfunction, weight loss, systemic inflammation and psychological problems. Decreased exercise capacity, functional mobility and peripheral muscle performance have been well demonstrated in patients with COPD but emerging evidence is showing that these patients have an important deficit in balance control. The ability to maintain stability and balance is critical for functional independence in activities of daily living, mobility and for avoiding falls. An impaired balance has been associated with an increased risk of falls resulting in a higher mortality rate among older adults.

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Falls are an important health problem with significant consequences for older adults. It is estimated that 30–50% of people over 65 years old fall at least once a year. Tinetti *et al.* defined a fall as “an event which results in a person coming to rest unintentionally on the ground or lower level, not as a result of a major intrinsic event or overwhelming hazard”.

The risk factors for falls can be divided into intrinsic and extrinsic. Intrinsic factors are patient-related and include: chronic diseases, advanced age, gait deviations, muscle weakness, multiple medications and altered mental status. Extrinsic factors include dangerous activities such as walking on slippery surfaces, improper footwear, unstable living conditions or environmental hazards. It is reasonable to assume that the risk of falls increases as the numbers of risk factors accumulate. Patho-physiological features of COPD suggest that people who suffer from this disease have many risk factors that had been also identified in older individuals, such as, muscle weakness, multiple medications and polyneuropathy.

Falls are not only associated with mortality and morbidity but are linked to poorer overall functioning and early admission to long-term care facilities; therefore, reducing fall risk is an important public health objective^[3].

Falls in the elderly have devastating consequences for functional independence, social interaction and life expectancy. Well established risk factors for falls such as lower limb muscle weakness as well as deficits in functional performance and postural control and common in people with chronic obstructive pulmonary disease. The results from a recent study suggest that COPD is one of the chronic conditions with the highest prevalence of falls, second only to osteoarthritis. Falls incidence in people with COPD has been estimated to range between 25 and 46%. The studies exploring fall incidence in COPD, however, have collected data with regards to falls retrospectively. Current international guidelines for the design of fall prevention trials stress the importance of recording fall events prospectively in order to minimize the effect of recall bias that is inherent in most retrospective fall risk studies. In addition, cross sectional designs are susceptible to reverse causality.

Case Report

A 57-year-old male COPD patient complained of frequent fall without any neurological issues. His activities of daily living were hampered due to fear of fall, particularly forward bending activities like picking objects on floor, he stopped doing community walking, gardening, going to shops etc., due to this he started resting more in one place that leads to overall body weakness. Due to reduced physical function physical capacity is reduced and exercise tolerance is also reduced. He came to my clinic with walker due to fear of fall.

On Examination Findings

All the neurological tests as been done like brain MRI, EEG to roll out any neurological link to fall in this patient but Brain MRI and EEG are normal. In my clinic I tested BBS 50/56 and stand up and 6 minutes' walk test is also down. Finally, it realise that is fear of fall due to reduced physical capacity and reduced physical function.

Physiotherapy Management

My primary goals of treatment are to control symptoms, improve the quality of life, and reduce fear wail doing Physical activity. Started with educating about COPD and 10

minutes of aerobic exercise like bicycling for 5 minutes and treadmill with speed of 4.5 for 5 minutes and supervised walking in uneven surface, this exercise protocol was continued for 6 weeks. After 6 weeks again outcome measures like berg balance scale and 6 minutes' walk test was taken both are shown better than the first reading.

Discussion

Chronic obstructive pulmonary disease not only affects lung and its functions but also causes muscle weakness, and affects the balance and posture in subjects. The older adults are more prone at getting affected by COPD, and are at a higher risk of getting balance and postural problems.

There have been many studies done with large sample of subjects by using many scales to know the association of fear of falls in patients with COPD. These studies have identified that fear of falls are more common in chronic obstructive pulmonary disease patients, mainly in older adults and aerobic exercise and walking in uneven surface will reduce the fear of fall in COPD patients.

The present review considered all articles on fear of falls in patients with COPD from 2009 to 2022. A total of 7 articles were reviewed and all the articles found a strong correlation between COPD, fear of falls in the elderly population and physiotherapy management. The worse the COPD condition, there was a more fear of falls and problems in balance and posture in the patients.

Conclusion

COPD plays a major role in fear of falls in older adults. This is due to lower quadriceps muscle strength among patients with COPD and due to some medications taken for COPD conditions which affect balance and causes falls in patients with COPD 6 week of physiotherapy management will improve overall lung capacity and reduce fear of fall in patient with COPD.

Recommendation

There must be a proper training and education about the disease and the problems in balance and falls to such patients; and appropriate aids must be provided to correct the balance and posture, and assist in ambulation in these patients.

Further studies on fear of falls in patients with COPD, and comparison with other interventions to prove the consistency is recommended. Other factors that affect fear of falls should be taken into consideration, and a further research is required in this aspect.

Further studies with many laboratory tests are needed to understand proper reason for fear of falls in chronic obstructive pulmonary disease.

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