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Management Of Active Cycle Of Breathing Techniques (ACBT) And Postural Drainage In Bronchiectasis: A Case Study

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Abstract

Introduction: Bronchiectasis is a debilitating chronic respiratory condition that affects people of all ages. It is most common in women and those older than 60 years, Patients have daily excessive sputum and associated symptoms, recurrent chest infections and impaired health-related quality of life

Case Presentation: The patient is a 54 year old woman with a history of bronchiectasis, complaining of shortness of breath, cough accompanied by phlegm that has been felt since 6 months ago.

Management and Outcome: Interventions were given in the form of Active Cycle of Breathing Techniques (ACBT) and Postural Drainage and the therapy process was carried out in 3 meetings. Examination of the degree of cough with the Leicester Cough Questionnaire, examination of the thoracic cage with anthropometry with 3 measurement reference points, namely the axilla, Intercostal IV-V, and xiphoid process, and measurement of functional activity level with the Modified Medical Research Council (MMRC). There was an increase in the difference in expansion of the thoracic cage at each axillary point, Intercostal IV-V, and xiphoid process from T1: 1 cm to T3: 2 cm. on the measurement of the degree of cough with the Leicester Cough Questionnaire there was an increase in the value from T1:7 to T3:12, and the measurement of functional activity level with the Modified Medical Research Council (MMRC) decreased from T1:3 to T2:2.

Discussion: ACBT that performed in 3 stages, can reduce airway constriction and increase oxygen saturation through breathing control, thoracic expansion exercises that move secretions and increase alveolar ventilation, and the huffing or force expiratory technique (FET) which helps move phlegm from the small airways into the airways. big air. This is also assisted by postural drainage, which is positioning the patient with the lung segment where there is a buildup of sputum in such a way that gravity has a maximum effect on facilitating the drainage of broncho-pulmonary secretions from the tracheobronchial tree.

Conclusion: Active Cycle of Breathing Techniques (ACBT) and Postural Drainage can help treat complaints in cases of Bronchiectasis such as clearing the airway, increasing the expansion of the thoracic cage, and increasing the ability of functional activities.

Keyword: Bronchiectasis, Active Cycle of Breathing Techniques (ACBT), Postural Drainage

Introduction

Bronchiectasis is a chronic lung disease characterized by persistent widening of the bronchial airways and the weakening of the function of mucociliary transport mechanisms due to repeated infections that contribute to bacterial invasion and accumulation of mucus in all bronchial branches. The prevalence of bronchiectasis has been found to range from 67 to 566.1 per 100,000 population in Europe and North America (Germany, Spain, UK, and USA), and has reached 1200 per 100,000 population among those aged 40 years or more in China. In fact, bronchiectasis is one of the three most common chronic inflammatory airway diseases (along with chronic obstructive pulmonary disease (COPD) and asthma) that is gaining increasing global attention (Guan *et al.*, 2019).

Physiotherapy has an important role in helping to overcome the symptoms of bronchiectasis. Since the mucociliary clearance is reduced to about 15% of normal, the patient tends to cough more. Physiotherapy treatment is aimed at helping the clearance of secretions, and increasing the ability of functional activities (Rajala *et al.*, 2017). The most common and effective treatments are Active Cycle of Breathing Technique (ACBT) and Postural Drainage, both of which aim to loosen and clear excess lung secretions, increase cough effectiveness and to improve ventilation and lung function, and help clear secretions of certain lung segments.

Based on the above background, it can be concluded that the purpose of this study is to determine the effect of Physiotherapy management with Active Cycle of Breathing Technique (ACBT) and Postural Drainage in clearing the airway in cases of Bronchiectasis. Knowing the effect of Physiotherapy management with Active Cycle of Breathing Technique (ACBT) and Postural Drainage in increasing the expansion of the thoracic cage in cases of Bronchiectasis.

Case Presentation

The patient is a 54 year old housewife complaining of a cough with phlegm that has been felt since 6 months ago and was diagnosed with bronchiectasis, there are family members of the patient who smoke. The patient has a prolonged exhalation pattern where the expiration time is longer than the inspiration. On auscultation, the sound of the right lung rhonchi was found in the anterior apical lobe. In this case the patient did not complain of any pain that was felt related to his complaint. Patients come to physiotherapy every 2 times a week. The results of palpation found spasm of the right pectoralis major. The patient's residence is close to the sugar factor, the patient's cognitive is good because the patient is able to tell the course of the disease in a coherent manner.

Management and Outcome

Patients were given Active Cycle of Breathing Techniques (ACBT) and Postural Drainage 2 times

a week for 3 weeks. The administration of Active Cycle of Breathing Techniques (ACBT) is divided into 3 stages, the first is Breathing Control, the patient is in a sitting position leaning on the bed, then Instructs the patient to do inspiration & expiration as usual according to the patient's comfort, the patient may be instructed to take 3- 6 breaths. The next stage is the Deep Breathing Exercise or Thoracic Expansion Exercise, with the patient instructing the patient to take long, slow and deep breaths, through the nose, at the end of the inhale, hold the air for 2-3 seconds before exhaling (this is known as an inspiratory hold), then Exhale gently and relaxed, repeat 3-5 times. Then the last stage is huffing, which is the technique of exhaling through an open mouth, instruct the patient to take a deep breath, open the mouth wide and exhale quickly, do 1-2 times (Jones & Moffatt, 2018). For postural drainage, the patient is positioned half lying with a backrest on the bed for 20 minutes according to the location of the sputum, namely in the right lung of the anterior apical lobe (Rajala *et al.*, 2017). The outcome used in this case is the examination of the degree of cough with the Leicester Cough Questionnaire (LCQ), the LCQ is a 19 item questionnaire that assesses QOL related to cough. It has 3 domains (physical, psychological and social). The total score ranges from 3-21 and the domain scores range from 1-7; a higher score indicates a better quality of life (Yousaf *et al.*, 2013). Examination of the thoracic cage with anthropometry, and measurement of functional activity level with the Modified Medical Research Council (MMRC), is a self-assessment tool to measure the degree of disability caused by shortness of breath. breath on daily activities on a scale of 0 to 4: 0, no shortness of breath except on strenuous activity; 1, shortness of breath when rushing on a level or walking slightly uphill; 2, walking slower than people of the same age due to shortness of breath or having to stop to catch their breath when walking; 3, stop to breathe after walking 100 m or after a few minutes on a flat surface; and 4, too breathless to leave the house, or shortness of breath when dressing or undressing (Rajala *et al.*, 2017).

Table 1. LCQ and MMRC measurements

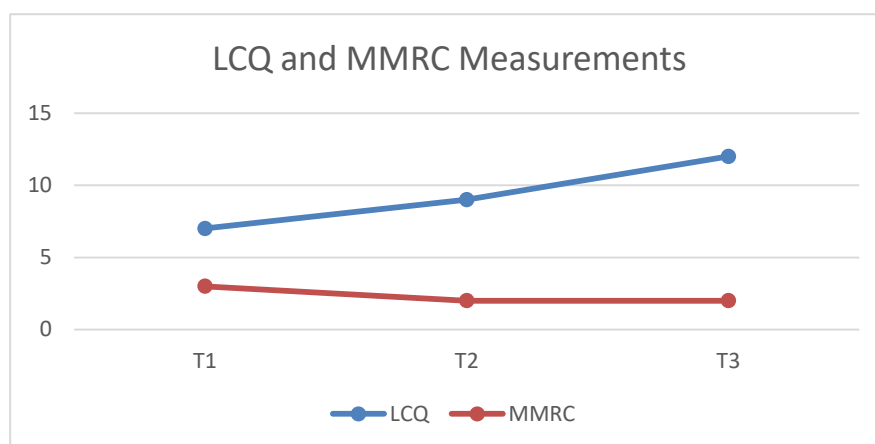
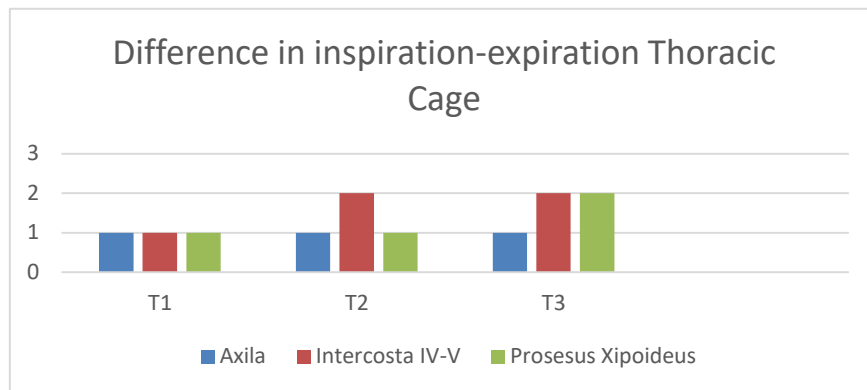


Table 2. The difference in inspiration-expiration Thoracic Cage



Discussion

The examination of the expansion of the thoracic cage in cases of bronchiectasis was carried out using a midline with 3 reference points, namely the Axilla, Intercostal IV-V, and Processus Xipoidesus. In Intercostal IV-V, and the xiphoid reference points process from T1: 1 cm to T3: 2 cm. on the measurement of the degree of cough with the Leicester Cough Questionnaire there was an increase in the value from T1: 7 to T3:12, and the measurement of the level of functional activity with the Modified Medical Research Council (MMRC) decreased from T1:3 to T2:2. In bronchiectasis, abnormal dilation of the airways causes excessive coughing and sputum production, difficulty breathing, and fatigue that results in decreased levels of functional activity with repeated exacerbations. ACBT performed in 3 stage can reduce airway constriction and increase oxygen saturation through breathing control, thoracic expansion exercises that move secretions and increase alveolar ventilation, and the huffing or force expiratory technique (FET) which helps move phlegm from the small airways into the bigger airways (Merriman, 2014). This is also assisted by postural drainage, which is positioning the patient with lung segments where there is a build-up of sputum in such a way that gravity has a maximum effect on facilitating the drainage of broncho-pulmonary secretions from the tracheobronchial tree (Shivbalan S, 2015).

Conclusion

The Active Cycle of Breathing Techniques (ACBT) and Postural Drainage can help treat complaints in cases of Bronchiectasis such as clearing the airway, increasing expansion of the thoracic cage, and increasing the ability of functional activities. This study has a limitation that the patient has previously received physiotherapy treatment which makes changes to the evaluation results that do not show non-significant data

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