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The Relationship Between Cough Strength and Exercise Capacity in Patients with Bronchiectasis: Pilot Study

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Objectives: Exercise capacity is adversely affected by symptoms such as excessive sputum production in bronchiectasis patients, ineffective coughing due to inadequate sputum excretion, dyspnea and decreased muscle strength. It has been reported that cough strength can be evaluated objectively and effectively with Cough PEF. However, there are no studies evaluating the relationship between coughing and exercise capacity in patients with bronchiectasis. In this study, we aimed to investigate the relationship between coughing and exercise capacity of patients with bronchiectasis.

Methods: The study included patients with bronchiectasis who were admitted to the Department of Pulmonary Disease. After demographic information, dyspnea perception was measured by Modified Medical Research Council (MMRC) scale. Exercise capacities were evaluated with six minutes walking test. The coughing rate was determined using the Cough PEF. The peak cough flow rate (Cough PEF value) was determined by measuring the values achieved by the coughing maneuver following deep inspiration. The measurement was repeated three times and the highest value recorded for analysis. The relationship between the data was tested using Spearman correlation analysis and partial correlation analysis.

Results: The mean age of the 21 patients (12E/9K) was 50.19±4.63 years. The mean height of the patients was 166,66±7,83 m and the mean body weight was 72±12,88 kg. The mean body mass index was 26.05±5.16 kg/m². The disease duration was 22.73±15.31 years. MMRC dyspnoea score was 2.35±1.03. Six minutes walking distance average 403,40±133,38 m, Peak Cough Current velocity values, Cough PEF mouthpiece and mask for measurements with 325±146 L/min and 284±112 L/min respectively. There was no significant difference between the two measurements (p<0.05). A positive correlation was found between both the Cough PEF mouthpiece and mask with peak cough flow rate and 6 min walk test (r=0.532 p=0.013; r=0.517, p=0.017, respectively). When the same analysis was performed independently of age, a positive mid-level relationship was found between the 6-minute walk test and the cough PEF mouthpiece and mask (r=0.489, p=0.034, r=0.488, p=0.034, respectively).

Conclusion: The decrease in coughing force was associated with a decrease in exercise capacity, independent of age. Therefore, we think that cough force, which is more functional and reflects the role of respiratory muscles should be added to the evaluation parameters. In addition both measurement methods using mouthpiece and mask can be used to determine the cough strength.

Keywords: Cough strength, exercise capacity, bronchiectasis