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Investigation of Pulmonary Function Parameters in Adults with Substance Use Disorders: A Pilot Case-Control Study

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Objectives: Substance use and addiction is an increasing problem in our country as well as all over the world. The frequency and duration of substance abuse threaten the upper and lower respiratory tract and impair lung health because nearly all of the substances are taken by the airways. Recent studies have also reported that substance abuse has significant adverse effects on the respiratory system. However, data on pulmonary function parameters of substance-dependent individuals are insufficient in our country. Therefore, the aim of our study was to investigate the effect of substance use on pulmonary function parameters in individuals with substance use disorders.

Methods: Forty-three adults (5 female) who were hospitalized in Bakirkoy Prof.Dr. Mazhar Osman Mental Health and Neurological Diseases Hospital, Alcohol and Drug Research Treatment and Training Center (AMATEM) and 36 healthy volunteers (12 female) with similar demographic characteristics were included in the study. Written informed consent was obtained from all participants. Spirometric measurements (MIR Spirobank II) and respiratory muscle strength (Carefusion Micro RPM) were evaluated. The highest results were obtained from at least 3 measurements according to the acceptability and repeatability criteria for spirometric measurements. Maximum inspiratory pressure (MIP) and maximum expiratory pressure (MEP) measurements were repeated at least 3 times and the values, which were the highest of the three measurements with a difference of less than 20%, were evaluated. The Turkish Thoracic Society supports the present work (Project No: Y-110/2018).

Results: The mean age of substance-dependent participants and healthy participants were 29.7±8.5 and 31.5±10.3 years (p=0.40). The ratio of smokers was 100% (15.19±8.93 pack-years) in substance-dependent participants and 0% in healthy participants (p=0.001). The mean duration of substance using was 12.3±6.9 years. The preferred substances were Heroin (n=23, 53.5%), Cannabis (n=12, 27.9%) and Bonzai (n=8, 18.6%). No significant difference was found between the FVC, FEV1, FEV1/FVC, FEV3, FEV6 and FEF25-75% values compared to healthy participants (p>0.05). The MIP was 75.11±21.68 cmH₂O in substance-dependent participants and 88.89±16.28 cmH₂O in healthy participants (p=0.002) while the MEP was 102.30±32.14 cmH₂O in substance-dependent participants and 131.33±37.66 cmH₂O in healthy participants and (p=0.0001).

Conclusion: In our study, it was found that spirometric measurements of substance-dependent participants were similar to healthy participants. However, inspiratory and expiratory muscle strengths were significantly decreased in substance-dependent participants compared to healthy participants. Long-term results of substance use and its effect on respiratory muscle strength should be investigated in future studies.

Keywords: Bonsai, cannabis, heroin, respiratory muscle strength, spirometry, substance abuse