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Effects of Smoking and Smokeless Tobacco “Maras powder” use on Cardiac Autonomic Function and Inflammation

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Smoking is the most preventable risk factor for cardiovascular diseases. A kind of smokeless tobacco known as Maras powder, which is used in the southeastern region of Turkey, causes nicotine dependence. Maras powder is used by the addicts through buccal mucosa instead of cigarette or to give up smoking. Its negative effects on cardiovascular system could not yet fully understood.

Smoking leads to an increased inflammatory activity. The total white blood cell count and its subtypes, such as neutrophil, lymphocyte, and neutrophil/lymphocyte ratio (NLR), uric acid, gamma-glutamyltransferase (GGT) and C-reactive protein (CRP) can be used as an indicator of systemic inflammation. NLR has been associated with poor outcomes in patients with several cardiovascular diseases. However, there is limited data about the role of NLR in subjects with smokers and Maras powder users.

Cardiac autonomic nervous system (ANS) plays an integral role in the modulation of normal cardiac electrophysiology and regulating cardiac activity. In daily practice, cardiac ANS can be evaluated by several tools like heart rate recovery (HRR), chronotropic incompetence, and regulating cardiac activity. In daily practice, there is limited data about the role of NLR in subjects with smokers and Maras powder users. The present study was designed to evaluate HRR, chronotropic response, QT dynamics, and inflammatory status in smokers and Maras powder users.

Study population consisted of 92 male subjects: 32 non-smoker and non-Maras powder user healthy volunteers, 32 cigarette smokers, and 30 Maras powder users. Blood samples were taken for total white blood cell count, uric acid, GGT and CRP. The NLR was calculated by dividing neutrophil percentage to lymphocyte. Cardiac ANS indices including HRR and chronotropic response were calculated from exercise stress test parameters. The Tp-e interval and Tp-e/QT ratio were measured from a 12-lead electrocardiogram, and the Tp-e interval corrected for heart rate. These parameters were compared among groups.

Aortic, and laboratory parameters of the groups are shown in Table 1. NLR, uric acid, and CRP were not different among groups (p>0.05). The percentage of lymphocytes and GGT levels were weakly but significantly different among groups (p<0.05). Data from exercise stress testing and electrocardiographic examination were listed in Table 2. Peak heart rate was significantly lower in Maras powder users (p=0.005). The percentage of chronotropic incompetence in Maras powder users was significantly higher than controls (p=0.02). Corrected Tp-e interval and Tp-e/QT ratio were not different among groups (p>0.05).

Inflammatory status measured by NLR, serum levels of uric acid, and CRP were similar in subjects with healthy volunteers, smokers and Maras powder users. Also, Tp-e interval and Tp-e/QT ratio as indices of ventricular repolarisation were similar in our study population. The use of Maras powder was significantly attenuated heart rate response to exercise.

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Aortic Distensibility and Aortic Intima-Media Thickness in Patients without Clinical Manifestation of Atherosclerotic Cardiovascular Disease

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Background: There is growing evidence that aortic distensibility (AD) is a subclinical marker of early atherosclerosis. Aortic intima-media thickness (IMT) is an earlier marker than carotid IMT of preclinical atherosclerosis. In this study, we aimed to assess the relationship between thoracic aortic AD and IMT.

Methods: We studied 192 patients (mean age, 45.5±8.4 years) who underwent transthoracic echocardiography (TEE) for various indications. Four different grades were determined according to IMT of thoracic aorta (Grade-1 <1 mm; 1 mm ≤ Grade-2 <3 mm; 3 mm ≤ Grade-3 <5 mm; 5 mm ≤ Grade 4). AD was calculated from the echocardiographically derived ascending aorta diameters and hemodynamic parameters in all patients. High sensitive C-reactive protein (hsCRP) and other biochemical markers were measured with an automated chemistry analyzer.

Results: TEE evaluation characterized thoracic aortic intimal morphology as grade 1 in 71 patients (37%), grade 2 in 57 patients (29%), grade 3 in 34 patients (17%) and grade 4 in 30 (15.6%) patients. The lowest AD level was observed in grade-4 group compared with grade-1 and grade-2 groups (p<0.001, p=0.009, respectively). AD level of grade-3 group was lower than grade-1 and grade-2 groups (p<0.001, p=0.021, respectively) (Table). In multiple linear regression analysis, AD was independently associated with age (β=-0.138, p=0.029), hsCRP (β=-0.209, p=0.001) and aortic IMT (β=-0.432, p<0.001).

Conclusion: AD is independently associated with age, thoracic aortic IMT and hsCRP. Impaired elasticity index of the aorta might be an independent predictor for the severity of thoracic atherosclerosis.