Letter to the editor: The effect of autonomic nervous system on the association between epicardial adipose tissue and cognitive function

Seref Ulucan, Zeynettin Kaya, Ahmet Keser, and Huseyin Katlandur
Department of Cardiology, Faculty of Medicine, Mevlana University, Konya, Turkey

TO THE EDITORS: With great interest, we read the recent article by Mazzoccoli et al. (3), an association study between epicardial adipose tissue (EAT) thickness and cognitive impairment in the elderly, in the American Journal of Physiology-Heart and Circulatory Physiology. The authors very clearly discussed the relationship between EAT thickness and cognitive impairment in the elderly. They focused on an association between EAT thickness as a measure of visceral adipose tissue and cognitive function (CF). In conclusion of their study; they suggested that increased EAT thickness assessed by transthoracic echocardiography is associated with deficient results of psychometric tests assessing cognitive performance and may consistently foresee impairment of cognition in the elderly. In our letter, we aim to emphasize another possible mechanism between EAT and impairment of CF in the elderly: the effect of autonomic nervous system (ANS).

Previous studies apparently revealed the obvious relationship between epicardial fat and CF. Vistisen et al. (4) investigated the relationship between motor and CF and ANS function. Heart rate variability (HRV) and its change during neurorehabilitation were associated to early functional ability. Zeki et al. (5) suggest that reduced HRV is associated with worse performance on the test of global CF, above and beyond traditional cardiovascular risk factors. The result of these studies, ANS function, is thought to play a role in the development of impairment of CF.

There are several studies demonstrating a close relationship between EAT and cardiac autonomic function. Balcioglu et al. (1) showed that sympathovagal imbalance is detected by HRV and heart rate turbulence parameters. Heart rate turbulence parameters are related to EAT thickness. As sympathovagal imbalance is a predictor of arrhythmogenic events, EAT may play an important arrhythmogenic role. The cardiac ganglionated plexus in the EAT integrates the autonomic innervation between the extrinsic and intrinsic cardiac ANS and affects atrial electrophysiology, and pathophysiology was showed by Zhou et al. (6). Moreover, Carnevali et al. (2) concluded that EAT deficiency in mice leads to an imbalance of the autonomic neural modulation of cardiac function in the sympathetic direction and to a potentially proarrhythmic remodeling of electrical and structural properties of the heart.

As a consequence, we believe that the relationship between ONS function may be helpful in explaining the result of the article by Mazzoccoli et al. (3). We hope that the above-mentioned items would add to the value of the well-written article of Mazzoccoli et al. regarding the relationship between epicardial adipose tissue and impairment of CF.

DISCLOSURES
No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS
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REFERENCES