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

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REPLY: The connection between the adipose tissue encasing the heart, the decline of cognitive function, and the role played by the autonomic nervous system, pinpointed by Ulucan et al. (5), is really appealing. In the last ten years, several reports have expanded our knowledge about the relationship between markers of cardiac autonomic function, such as heart rate variability, and cognitive impairment (1–4, 6). The interplay between cardiac autonomic dysfunction, particularly decreased parasympathetic activity, cognitive decline, as well as frailty, consisting in critical impairment of homeostatic mechanisms leading to enhanced vulnerability to stressors, opens the way to a wider comprehension of the pathophysiological basis of cognitive impairment (the question arises whether it is cause or consequence of disease mechanisms) and suggests unpredicted tools for risk stratification beyond traditional cardiovascular risk factors. The loss of complexity in the heart rate signal hallmark the degradation of cardiac autonomic control, implying a broader derangement of regulatory action on peripheral and central vasculature and, in particular, on central nervous system blood supply and flow, especially on the mechanisms underlying autoregulation of cerebral blood flow in addition to intrinsic basal (myogenic) tone. The recent report of an association between decreased physiological complexity underlying regulation of heart rate dynamics and increased epicardial adipose tissue volume adds a new actor on the scenario of the puzzling but fascinating topic represented by age-related deterioration in homeostatic regulatory mechanisms. The evaluation of epicardial fat thickness through transthoracic echocardiography as well as noninvasive measures of physiological complexity underlying heart rate dynamics could aid in screening and monitoring of frailty and cognitive decline in the elderly. Notwithstanding our improved understanding of the potential role of reduced cardiovascular autonomic function in the interplay between increased visceral adipose tissue in the epicardial compartment and cognitive decline, the neural pathways and the humoral factors through which autonomic nervous system deregulation relays to cognitive decline and epicardial fat increase need to be elucidated in future studies.

DISCLOSURES
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AUTHOR CONTRIBUTIONS
G.M. drafted manuscript.

REFERENCES