Novel results and future perspectives of study of cardiovascular autonomic control in prediabetic patients

For quite a while, heart rate variability (HRV) and heart rhythm turbulence (HRT) have been subjects of research for patients with different cardiac pathology (1, 2). It's well known that diabetes mellitus associated with cardiac autonomic nervous dysfunction (CAND) results in changes to HRV and HRT parameters (3). CAND increases risk for cardiac arrhythmia, orthostatic hypotension, and myocardial infarction (MI). It also increases mortality in post-MI patients (4-6).

Balcıoğlu et al. (7) demonstrated the association between prediabetic condition (isolated fasting hyperglycemia) and CAND in an article in the current issue of the Anatolian Journal of Cardiology entitled "Cardiac autonomic nervous dysfunction detected by both heart rate variability and heart rate turbulence in prediabetic patients with isolated impaired fasting glucose." HRT abnormality, considered an autonomic imbalance, was found in prediabetic patients. According to Balcıoğlu et al. (7) and some other researchers (8, 9), damage to neurofibers responsible for regulating cardiac and vascular function under hyperglycemia is one reason for CAND in diabetic patients. This statement is supported by the association between isolated fasting hyperglycemia and all evaluated parameters of autonomic cardiac regulation. Those fi ndings are extremely important for preventive cardiovascular medicine in prediabetic patients. The authors report only 1 study limitation: They didn't include spectral analysis of HRV, which we hope they consider for future research.

We would also like to emphasize that HRV and HRT are quite useful for anatomic cardiac regulation, but not the regulation of peripheral blood flow. Further research in the field, suggested by Dr. Balcıoğlu et al. (7), may create a new research subject "autonomic function of cardiovascular system" instead of "autonomic function of the heart" in prediabetic patients. The synchronization of low-frequency oscillations in HRV and photoplethysmographic waveform variability (PPGV) reflects the functional interaction between the heart and peripheral circulation by means of autonomic regulation mechanisms (10). In healthy patients, these slow oscillations in HRV and PPGV are continuously synchronized almost all the time (10). Synchronization of low-frequency oscillations may be useful in cardiac event risk stratification (11) and control of therapeutic treatment (12) in patients with hypertension and MI. Further research regarding the interaction between slow oscillations in HRV and PPGV among prediabetic patients may complete and expand the results of Dr. Balcıoğlu et al. (7).

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