Editorial / *Editöryal Yorum*

Heart rate turbulence, can be used to assess of stable coronary artery disease and its severity?

Kalp hızı türbülansı, kararlı koroner arter hastalığı ve yaygınlığını değerlendirmede kullanılabilir mi?

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Identification of high-risk cardiac patients is crucial for stratification strategies and prevention of cardiovascular events, including death. Heart rate variability (HRV), based on RR interval assessment, is one of the oldest Holter-derived risk stratification parameters. In 1999, Schmidt et al. described the phenomenon of heart rate turbulence (HRT), a measure of the autonomic response to perturbations of arterial blood pressure invoked by a ventricular premature beat (VPB).[1] HRT is the initial acceleration and subsequent deceleration of sinus rhythm following VPB, with a compensatory pause. Single VPB triggers oscillations in cardiac cycle duration. A VPB beat results in a transient drop in blood pressure, which triggers activation of baroreceptors and leads to an immediate vagal inhibition and increase in heart rate. Augmented myocardial contractility following VPB and the subsequent increase in blood pressure lead to an opposite reaction, with subsequent decrease in sinus node activity, and thus the biphasic HRT curve of acceleration and deceleration occurs. In healthy subjects, VPB provokes a biphasic reaction of early acceleration and late deceleration of the heart rate, while in high risk subjects, such a reaction is diminished or even completely absent.

HRV and HRT are validated methods for the evaluation of cardiac autonomic nervous system dysfunction. Decreased HRV and HRT are believed to be mechanisms contributing to an increased risk of developing life threatening arrhythmias.

Abbreviations:

CAD	*Coronary artery disease*
HRT	*Heart rate turbulence*
HRV	*Heart rate variability*
TS	*Turbulence slope*
VPB	*Ventricular premature beat*

HRT is calculated from long-term Holter recordings. Specialized computer software is required to measure small beat-to-beat variations in RR intervals. HRT is represented by 2 parameters: turbulence onset (TO), reflecting the initial acceleration of heart rate after VPB, and turbulence slope (TS), describing the subsequent deceleration of heart rate following VPB. Abnormalities in HRT, potentially reflecting autonomic dysfunction or impaired baroreflex sensitivity, were observed in up to 10% of the apparently healthy subjects.[2]

Several large clinical studies have shown the prognostic value of decreased (or abnormal) HRT in identifying patients at high risk of arrhythmic mortality. These studies were performed especially in patients with myocardial infarction and congestive heart failure. Furthermore, the predictive value of HRT upon arrhythmic events, including hypertension, diabetes, and pulmonary hypertension, was studied in different patient groups.[3-7]

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There is limited data regarding the value of HRT parameters in patients with stable coronary artery disease (CAD) and its relationship to the severity of the disease.[8] Baydar et al.[9] compared the HRT parameters between patients with and without CAD in their study. They demonstrated that HRT values were abnormal in patients with CAD compared with the control group. In this study, a significant correlation between HRT parameters and Gensini score was found. Studies have suggested that although the majority of patients with stable CAD at low risk have good prognosis, impaired HRT values can indicate increased mortality risk. The limitation of this study is that it was conducted in a small patient population.

The analysis of HRT is an inexpensive and simple method which can be performed with a routine ambulatory 24-hour electrocardiogram (ECG) recording. However, despite the promising outcomes of the early studies, this predictor has not influenced clinical practice yet. Long-term prospective studies are needed to assess the prognostic importance of impaired HRT in stable CAD.

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