



HEART RATE VARIABILITY AND MYOCARDIAL STATUS IN OBESE PATIENTS

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Abstract: *Heart rate variability (HRV) has emerged as a new and important tool used to evaluate the autonomic nervous system (ANS) and cardiovascular regulation. The aim of this article is to review the current literature regarding HRV and myocardial status in obese patients.*

Keywords: *Heart rate variability, HRV, myocardial status, obesity, cardiovascular disease, autonomic nervous system, sympathetic, parasympathetic.*

Obesity has become a major public health challenge around the globe. According to the World Health Organization (WHO), the prevalence of obesity has almost tripled since 1975, with the number of adults diagnosed with obesity surpassing 1.9 billion in 2016. In addition, the prevalence of childhood obesity has also tripled since the 1970s, with more than 340 million children between the ages of 5 and 19 years being categorized as overweight or obese in 2016. The association between obesity and cardiovascular disease has been well established. Cardiovascular disease remains the leading cause of mortality in developed countries, and due to the increasing prevalence of obesity, the incidence of cardiovascular disease is expected to increase. Mechanisms underlying the association between obesity and cardiovascular disease are complex and multifactorial. Study of HRV in obese patients with cardiovascular disease can provide insights into the mechanisms underlying the association between obesity and cardiovascular diseases. HRV refers to the oscillation in time between successive heartbeats, that is, the variation in intervals between consecutive R waves on the electrocardiogram. HRV reflects the fine modulation of the activity of the sympathetic and parasympathetic branches of the ANS on the heart.

HRV measurement is a non-invasive and relatively inexpensive method for assessing the physiological status of the ANS. HRV is used to evaluate the risk of sudden cardiac death, cardiovascular disease, diabetes, and metabolic disorders. HRV has also been shown to be a useful tool for assessing the efficacy of interventions for these conditions. The ANS is involved in the regulation of



cardiovascular function. The sympathetic branch of the ANS increases heart rate and contractility, while the parasympathetic branch decreases heart rate and contractility. HRV reflects the balance between these two branches of the ANS.

Myocardial status refers to the physiological and pathological changes in the myocardium, including the structural and functional changes in the heart. Myocardial status is determined by various factors such as age, gender, and lifestyle habits. Obesity is associated with myocardial dysfunction, and alterations in the myocardial structure and function can be detected in obese individuals. Obesity is associated with left ventricular hypertrophy, diastolic dysfunction, and increased vascular stiffness, all of which increase the risk of cardiovascular disease. Reduced HRV in obese individuals may indicate a disruption in the physiological mechanisms that regulate cardiovascular function. The reduction in HRV may increase the risk of cardiovascular disease in obese individuals.

Heart rate variability (HRV) is a measure of the variation in time between individual heartbeats. It is an indicator of the functioning of the autonomic nervous system, which regulates heart rate and other physiological processes. Abnormalities in HRV have been linked to a range of cardiovascular and non-cardiovascular disease states, including obesity. Obesity is associated with increased cardiovascular risk, including hypertension, dyslipidemia, and insulin resistance, leading to an increased incidence of myocardial infarction and sudden cardiac death. Studies have shown that obese individuals have reduced HRV compared to those who are not obese. This may be partly due to the increased sympathetic nerve activity associated with obesity, leading to increased sympathetic nervous system activation, reduced parasympathetic tone, and impaired HRV. The reduced HRV is also associated with impaired cardiac function in obese patients. Myocardial function is commonly assessed by echocardiography, which is a non-invasive imaging technique that allows for the assessment of the structure and function of the heart. Obese individuals have been found to have impaired myocardial function, which is likely due to the increased workload on the heart required to maintain blood flow to adipose tissue and peripheral organs. Studies have also shown that obesity is associated with structural changes in the heart, such as left ventricular hypertrophy, which can lead to heart failure over time. Several studies have investigated the relationship between HRV and myocardial status in obese patients.

In conclusion, HRV is reduced in obese patients, which is likely due to increased sympathetic nervous system activity and impaired cardiac function. Reduced HRV has been linked to impaired myocardial status in obese patients and



may be a marker of early cardiovascular disease. HRV could be used as a non-invasive screening tool to identify obese patients at increased risk of cardiovascular disease and could inform interventions aimed at reducing cardiovascular risk in this population.

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