**ABSTRACT**

Obese people have high chances of cardiovascular disease (CVD), which is supposed to be due to the alteration in autonomic nervous system (ANS) activity. The changes in ANS activity can be identified using heart rate variability (HRV). HRV is a non-invasive tool to measure the

ANS activity using linear and non-linear HRV features. The paper presents an aim to understand the effect of obesity on ANS using HRV parameters. Initially, sixteen control and sixteen obese subjects of both the gender between ages 20 to 50 were involved in the study after that synthetic minority oversampling technique (SMOTE) was used to increase the sample size of control and obese subjects from sixteen to fortyeight. The statistically significant difference between two groups was observed using the Independent t test. The statistical results of the study indicate the sympathovagal imbalance due to reduced parasympathetic activity. The statistical results were

validated by incorporating the machine learning technique into the study. Machine Learning (ML) algorithm helps to identify the most important predictor that can clearly differentiate control and obese subjects. The statistical and ML algorithm result shows changes in the sympathovagal balance due to decreased parasympathetic activity.