

A Computational Model for Heart Failure Stratification

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Heart failure (HF) is a kind of serious cardiovascular diseases, which leads to an increasing burden imposed on public healthcare. The early diagnosis and proper treatment of HF are essential to reduce its morbidity and mortality. In spite of the implementation of clinical guidelines for HF, the early recognition and stratification of HF risk remain unsolved. The diagnosis accuracy of HF in practice was reported as lower than 50%. In this work, we supposed a computational model to classify HF stages. To determine the proper model methods, Monte Carlo simulation was applied. And Naïve Bayesian Classifier (NBC), Support Vector Machine (SVM) and Radial Basis Function Network (RBF) etc. models were therefore investigated. On the basis of the models assessment, an optimum classification model constitutive of SVM was derived. The model was tested on 389 subjects. The results show that totally 81.06% cases are consistent with the outcomes by AHA/ACC staging system. And the recognition accuracy of stage A, B and C in HF are 83.82%, 82.80%, and 77.67%, respectively. This work may facilitate an early diagnosis for HF and its proper stratification, and therefore improve the prevention as well as the treatment of HF.