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After acute myocardial infarction, depressed heart rate variability (HRV) has been proven to be a powerful independent predictor of a poor outcome. Although patients with chronic congestive heart failure (CHF) have also markedly impaired HRV, the prognostic value of HRV analysis in these patients remains unknown. The aim of this study was to investigate whether HRV parameters could predict survival in 102 consecutive patients with moderate to severe CHF (90 men, mean age 58 years, New York Heart Association [NYHA] class II to IV, CHF due to idiopathic dilated cardiomyopathy in 24 patients and ischemic heart disease in 78 patients, ejection fraction [EF], 26%; peak oxygen consumption, 16.9 ml/kg/min) after exclusion of patients in atrial fibrillation with diabetes or with chronic renal failure. In the prognostic analysis (Cox proportional-hazards model, Kaplan-Meier survival analysis), the following factors were investigated: age, CHF etiology, NYHA class, EF, peak oxygen consumption, presence of ventricular tachycardia on Holter monitoring, and HRV measures derived from 24-hour electrocardiography monitoring, calculated in the time (standard deviation of all normal RR intervals [SDNN], standard deviation of 5-minute RR intervals [SDANN], mean of all 5-minute standard deviations of RR intervals [SD], root-mean-square of difference of successive RR intervals [rMSSD], and percentage of adjacent RR intervals >50 ms different [pNN50]) and frequency domain (total power [TP], power within low-frequency band [LF], and power within high-frequency band [HF]). During follow-up of 584 +/- 405 days (365 days in all who survived), 19 patients (19%) died (mean time to death: 307 +/- 315 days, range 3 to 989). Cox's univariate analysis identified the following factors to be predictors of death: NYHA (p = 0.003), peak oxygen consumption (p = 0.01), EF (p = 0.02), ventricular tachycardia on Holter monitoring (p = 0.05), and among HRV measures: SDNN (p = 0.004), SDANN (p = 0.003), SD (p = 0.02), and LF (p = 0.003). In multivariate analysis, HRV parameters (SDNN, SDANN, LF) were found to predict survival independently of NYHA functional class, EF, peak oxygen consumption, and ventricular tachycardia on Holter monitoring. The Kaplan-Meier survival curves revealed SDNN < 100 ms to be a useful risk factor; 1-year survival in patients with SDNN < 100 ms was 78% when compared with 95% in those with SDNN > 100 ms (p = 0.008). The coexistence of SDNN < 100 ms and a peak oxygen consumption < 14 ml/kg/min allowed identification of a group of 18 patients with a particularly poor prognosis (1-year survival 63% vs 94% in the remaining patients, p <0.001). We conclude that depressed HRV on 24-hour ambulatory electrocardiography monitoring is an independent risk factor for a poor prognosis in patients with CHF. Whether analysis of HRV could be recommended in the risk stratification for better management of patients with CHF needs further investigation.