Risk stratification for 1-year mortality in acute heart failure

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BACKGROUND: Simple tools for risk stratification of patients with acute heart failure (AHF) are an unmet clinical need, particularly regarding long-term mortality. METHODS: We prospectively enrolled 610 consecutive patients presenting to the emergency department with AHF. The diagnosis of AHF was adjudicated by two independent cardiologists. The classification and regression tree (CART) analysis was used to develop a simple risk algorithm. This was internally validated by cross-validation. RESULTS: One-year follow-up was complete in all patients (100%). A total of 201 patients (33%) died within 360 days. The CART analysis identified blood urea nitrogen (BUN) and age as the best single predictors of 1-year mortality and patients were categorised to three risk groups: high risk group (BUN <27.5 mg/dl and age <86 years), intermediate risk group (BUN <27.5 mg/dl and age >/= 86 years) and low risk group (BUN >/= 27.5 mg/dl). The Kaplan-Meier curves showed a significant increase in mortality in the high risk group compared with the lower risk groups (log-rank test p >0.001). The hazard ratio regarding 1-year mortality between patients identified as low and high risk was 2.0 (95% confidence interval, 1.7-2.4), with statistically significant differences between all risk groups (p >0.001). The likelihood-based 95%-confidence set for the age- and the urea-threshold is contained in the rectangular set defined by 25 mg/dl >/= urea threshold >/=30.6 mg/dl and 76 years >/= age threshold >/=96 years. CONCLUSION: These results suggest that AHF patients at low, intermediate and high risk for death within 360 days can be easily identified using patient's demographics and laboratory data obtained at presentation. Application of this simple risk stratification algorithm may help to improve the management of these patients.
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