

Acute Heart Failure in Elderly Patients: Prognostic and Predictive Factors



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Abstract

Acute heart failure (AHF) is a major public health concern, especially among the elderly, with high mortality and hospitalization rates. The PROTECT study included 2033 patients (mean age 72 years) with acute HF. Patients were divided into five groups according to age quintile: ≤59, 60-68, 69-74, 75-79, and ≥80 years. Death within 30 days or hospitalization for cardiovascular/renal disease and death after 30 and 180 days were studied. The prognostic significance of baseline characteristics for outcomes was assessed, the difference between groups and ages <80 years and ≥80 years. The predicting factors leading to an increased risk of AHF are: sodium level, systolic BP, NYHA class of HF, and blood urea, albumin levels.

Keywords: Heart Failure; Elderly; Prognostic; Predictive

Abbreviations: AHF: Acute Heart Failure; BP: Blood Pressure; BUN: Blood Urea Nitrogen; CV: Cardiovascular; HF: Heart Failure; NYHA: New York Heart Association Functional Classification; SBP: Systolic Blood Pressure

Background

Acute heart failure (AHF) is a leading cause of unexpected hospitalizations among the elderly and is linked to high mortality rates and poor prognostic outcomes [1]. Heart failure is most prevalent in the elderly, with an annual incidence of 20 to 30 cases per 1,000 individuals over the age of 80 [2]. It represents a major public health issue, an enormous financial burden, and a challenge for current cardiovascular research, especially when speaking about the elderly group of patients [1]. Due to the fact that cardiac insufficiency affects a large number of elderly people, The objective of this study was to critically assess current evidence regarding prognostic outcomes of elderly patients suffering from acute heart failure.

Methods

The data from statistical studies published over the past years in PubMed, Science, Frontiers, and on the website <https://clinicaltrials.gov/> were analyzed for the cluster "acute heart failure", "elderly patients", "prognosis".

Results

In the elderly population, AHF is linked to an 8%-10% mortality risk and a 15%-30% chance of hospital readmission within 30 days [1]. In 2015 European Journal of Heart Failure published some insights from the PROTECT trial that investigated 2033 patients of 72 years as of median age, that's why the article by Marco Metra, Robert J. Mentz [3] was chosen for the analysis. Patients were categorized into five age-based groups according to quintiles: ≤59 (n = 387), 60-68 (n = 395), 69-74 (n = 416), 75-79 (n = 373), and ≥80 years (n = 462) [3]. According to the current age classification by the WHO, category of «aged persons» starts at 60 years and lasts up to 74 years, «old people» include people from 75 to 89 years and «longevity» more than 90 years, so in this article will be considered the patients group started from 60 years and will be shown in detail the event rates such as death, worsening HF, rehospitalization for HF (1-7 days), death or CV/renal rehospitalization (1-30 days) and death through day 30 and 180. A similar percentage (13.6%, 15.5%, 17.0%, 14.1%)

of patients in each age group (60-68 years, 69-74 years, 75-79 years, ≥ 80 years accordingly) experienced death, worsening heart failure, or rehospitalization by day 7. Worsening heart failure occurred in approximately 10-15% of patients across all age groups [3]. However, the event rates for 30- and 180-day outcomes increased with age. For example, the 180-day mortality rate was 11.3% for patients aged ≤ 59 years and 23.9% for those aged ≥ 80 years. After summing up the earlier provided percentages of various events for each age group separately, we determined the following prognosis percentages of events happening for each group: 60-68 years with 46.3% (n=181) of events occurring; 69-74 years with 53.7% (n=221); 75-79 years with 62.6% (n=231); ≥ 80 years with 63.2% (n=287).

Assessment of the hazard ratio for multivariate predictors of outcome in persons aged < 80 and ≥ 80 years for death or rehospitalization for cardiovascular or renal causes within 30 days, and death within 180 days, demonstrated a predictive "increase" in the significance of factors when comparing patient groups for such measures as: sodium level, systolic BP, NYHA class of HF, and blood urea, albumin levels. High sodium levels (greater than 3 mgU/L) were associated with an increased risk of death or hospitalization for cardiovascular/renal disease at 30 days and were not associated with this risk at 180 days ($p < 0.10$). An elevated systolic blood pressure (SBP) greater than 10 mmHg was

associated with a lower risk of death or hospitalization within 30 days in patients younger than 80 years, but not in patients aged 80 years or older ($p < 0.10$). The presence of NYHA class IV, hospitalization for heart failure within the last year, 3+ edema, and a 20% increase in blood urea (BUN) level were associated with a higher risk of death or hospitalization within 30 days in both age groups ($p < 0.10$). So was a low albumin level of less than 3.5 mg/dL, which was associated with a higher risk of death or hospitalization within 30 days also in both age groups ($p < 0.10$).

Conclusion

Evidence suggests that, as older the patients' age group gets, the worse the prognosis percentage is, which supports the statement that the global aging population will continue to drive the heart failure epidemic into the next century.

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