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Admission Hyperglycemia in Setting of Acute Heart Failure is Associated with Increased In-hospital Mortality Among Patients without Diabetes

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Keywords
Hyperglycemia, Heart Failure, Diabetes Mellitus, Hospitalization

Comments
Medical student Nicholas Maselli participated in this study as part of the Senior Scholars research program at the University of Massachusetts Medical School.

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Background

Heart Failure (HF) in the setting of comorbid diabetes mellitus (DM) has been extensively examined and is associated with increased mortality. More recently, hyperglycemia independent of DM status during critical illness admissions has become recognized as an indicator of poor outcomes. Despite evolving understanding of DM in the setting of acute HF, hyperglycemia at time of admission for acute HF has not been examined with regard to in-hospital treatment and patient outcomes.

Methods

Worcester Heart Failure Study: The sample consisted of 9,748 residents of the Worcester (MA) metropolitan area hospitalized at all 11 greater Worcester medical centers for acute decompensated HF during the years 1995 - 2004 with data available on diabetic status and admission glucose measurements. Patients were stratified into three groups based on history of DM and admission hyperglycemia defined by glucose ≥200 mg/dL: 1) nondiabetic, normoglycemic (NDNG); 2) non-diabetic, hyperglycemic (NDHG) and 3) Diabetic (DM).

Results

- The average age of the study sample was 76.2 years, 43.9% were male, and 93.3% were Caucasian.
- Between 1995 and 2004, 56% of patients (n = 5428) were admitted in the NDNG group, 39% of patients (n = 3807) were in the DM group, and 5% of patients (n = 513) were in the NDHG group.
- The proportion of hospitalized patients with heart failure in the three glycemic groups remained relatively stable over the study period (1995-2004). (Figure 1)
- Non-diabetic, normoglycemic patients were similar to NDHG patients with respect to age and medical history. (Table 1)
- Non-diabetic, normoglycemic patients were significantly older and less likely to have a history of various comorbid conditions such as hypertension, stroke and renal disease when compared to diabetics. (Table 1)
- Diabetics and NDHG patients received significantly more cardiac medications and procedures than NDNG patients. (Table 2)
- Diabetics had significantly more lifestyle recommendations prescribed at discharge than both non-diabetic groups. (Table 2)
- The NDHG group had significantly higher in-hospital mortality than both the NDNG and DM groups. (Table 2)

Conclusions

The results of our population-based investigation demonstrate that non-diabetic patients hospitalized for acute HF who are hyperglycemic at the time of admission represent a vulnerable group of patients at risk for increased mortality during hospitalization. Hyperglycemia ≥200 mg/dL during acute HF hospitalization should be taken into account when providing in-hospital management for HF with additional consideration given to ascertainment of diabetic status and glycemic control.

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