Title

Characteristics of Patients Hospitalized With Severe Sepsis, Ambulances vs Non-ambulance Arrival: a National Cohort

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Background

Sepsis and acute organ dysfunction (severe sepsis or "SS") is a common, life-threatening condition in which outcomes are sensitive to timely initiation of treatment. Little is known about older ED patients with SS who arrive by ambulance (AU) compared to non-ambulance (NAU) arrival. We sought to characterize AU vs NAU patients admitted with SS

Methods

Using a stratified nationally representative sample (N=999,999) of 22.1 million Medicare enrollees aged 66 and older in 2010, we examined all admissions for SS during 2010-2012. Emergent ambulance transport to a hospital from a non-hospital setting was identified using claims data and matched temporally to that patient's hospital admission. A previously validated protocol was used to identify sepsis via ICD-9-CM codes. SS admissions present-on-admission (POA) were identified and non-POA cases excluded. Covariates analyzed were age, sex, race/ethnicity, 24 chronic condition comorbidities and (zip code based) income. Using logistic models we estimated relative risk of (a) ambulance use and (b) mortality (inpatient, 30-day and 90-day) by ambulance use status, each adjusted for patient demographics, comorbidity and socioeconomic status.

Results

A total of 46,438 SS admissions were identified during 2010-2012. Of those 37,829 were SS POA admissions (representing 31,990 unique patients and 8609 repeat admissions). 21,338 (56.4%) admissions were transported via ambulance. The only predictors of ambulance use were Alzheimer's dementia (OR 1.6, 95% CI 1.39-1.75), depression (OR 1.28, 95% CI 1.13-1.45), diabetes (OR 1.13, 95% CI 1.02-1.26), age 85+ (OR 1.6, 95% CI 1.36-1.80) and age 75-84 (OR 1.36, 95% CI 1.20-1.54). With respect to ambulance patients vs non-ambulance, in-hospital mortality AU vs NAU was 27.3% vs 23.8% (OR 1.20, 95% CI 1.07-1.34), 30-day mortality 44.3% vs 38.3% (OR 1.20, 95% CI 1.09-1.33) and 90-day mortality of 52.3% vs 45.6% (OR 1.21, 95% CI 1.10-1.33).

Conclusion

Approximately 1/2 of patients hospitalized with sepsis use ambulance transport. We identified few strong predictors of ambulance use. Despite likelihood of residual confounding favoring better outcomes among NAU patients, mortality was only marginally higher with ambulance use. Given the time-sensitive nature of effective sepsis treatment, improving AU use in sepsis may represent a public health strategy to improve patient outcomes.