

Association of Dementia with Mortality and Sepsis Quality Measures Among Patients Hospitalized with Sepsis

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Introduction

- Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection and disproportionately affects older adults.^{1 2}
- Older age is an established risk factor for sepsis incidence and mortality.²
- Dementia, including Alzheimer disease, is associated with increased infection-related hospitalizations.^{3 4}
- Patients with dementia frequently present with atypical manifestations of infection, such as altered mental status or functional decline rather than classic inflammatory signs, which may delay diagnosis and treatment.^{3 5}
- Despite the high prevalence of both sepsis and dementia, limited data exist examining whether pre-existing dementia independently influences sepsis-related outcomes in hospitalized patients.
- This study investigates whether dementia is associated with differences in mortality and adherence to quality measures among patients hospitalized with sepsis.

Aims and Objectives

The primary objectives of this study:

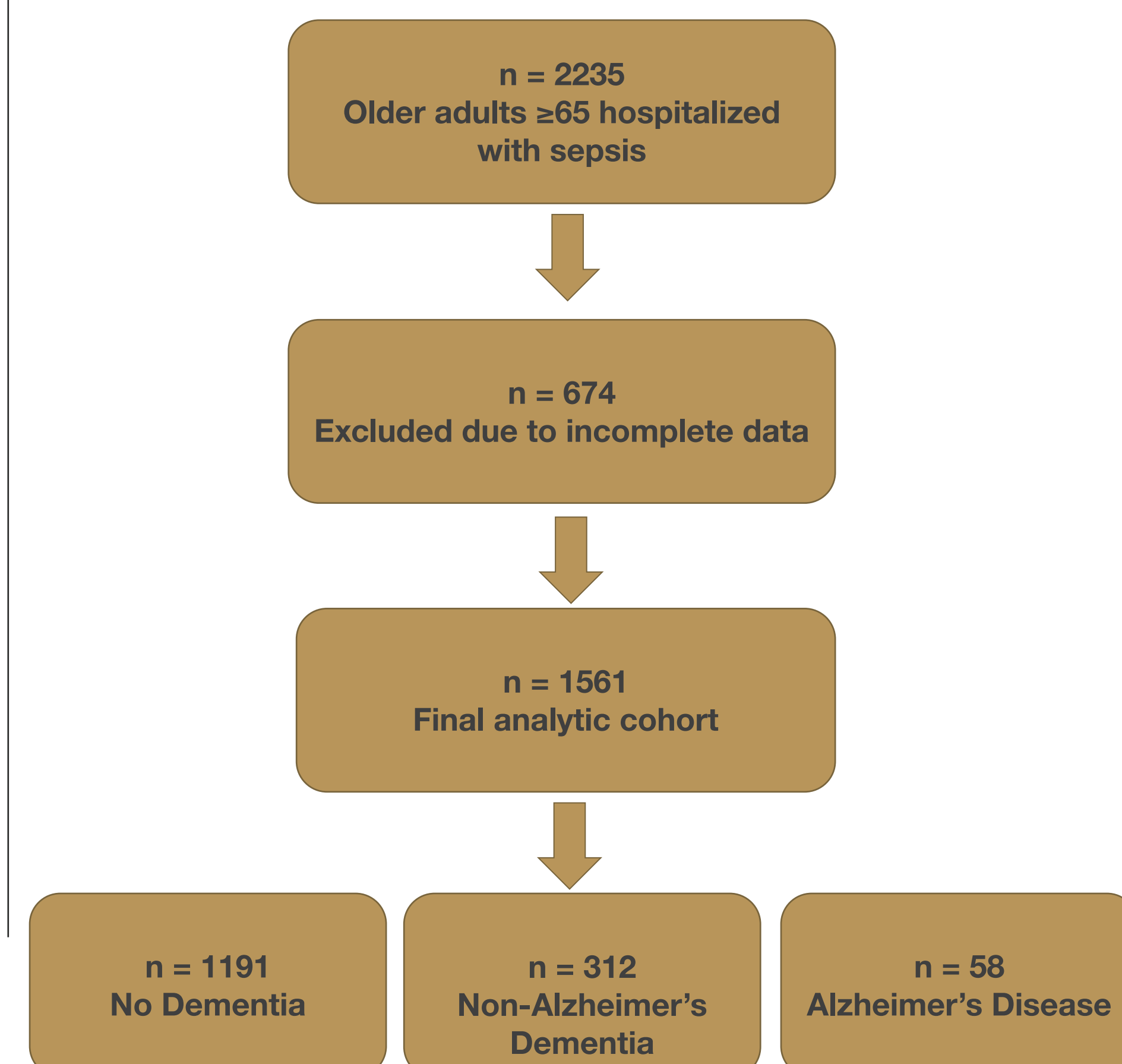
- To compare demographic characteristics and clinical outcomes among older adults hospitalized with sepsis with and without pre-existing dementia.
- To determine whether dementia is independently associated with:
 - Increased 30-day mortality
 - Variation in adherence to sepsis quality measures, including timely lactate measurement, fluid resuscitation, and blood culture collection

We hypothesized that patients with dementia would be associated with:

- Higher 30-day mortality
- Greater rates of sepsis quality measure fallouts compared to patients without dementia

Methods

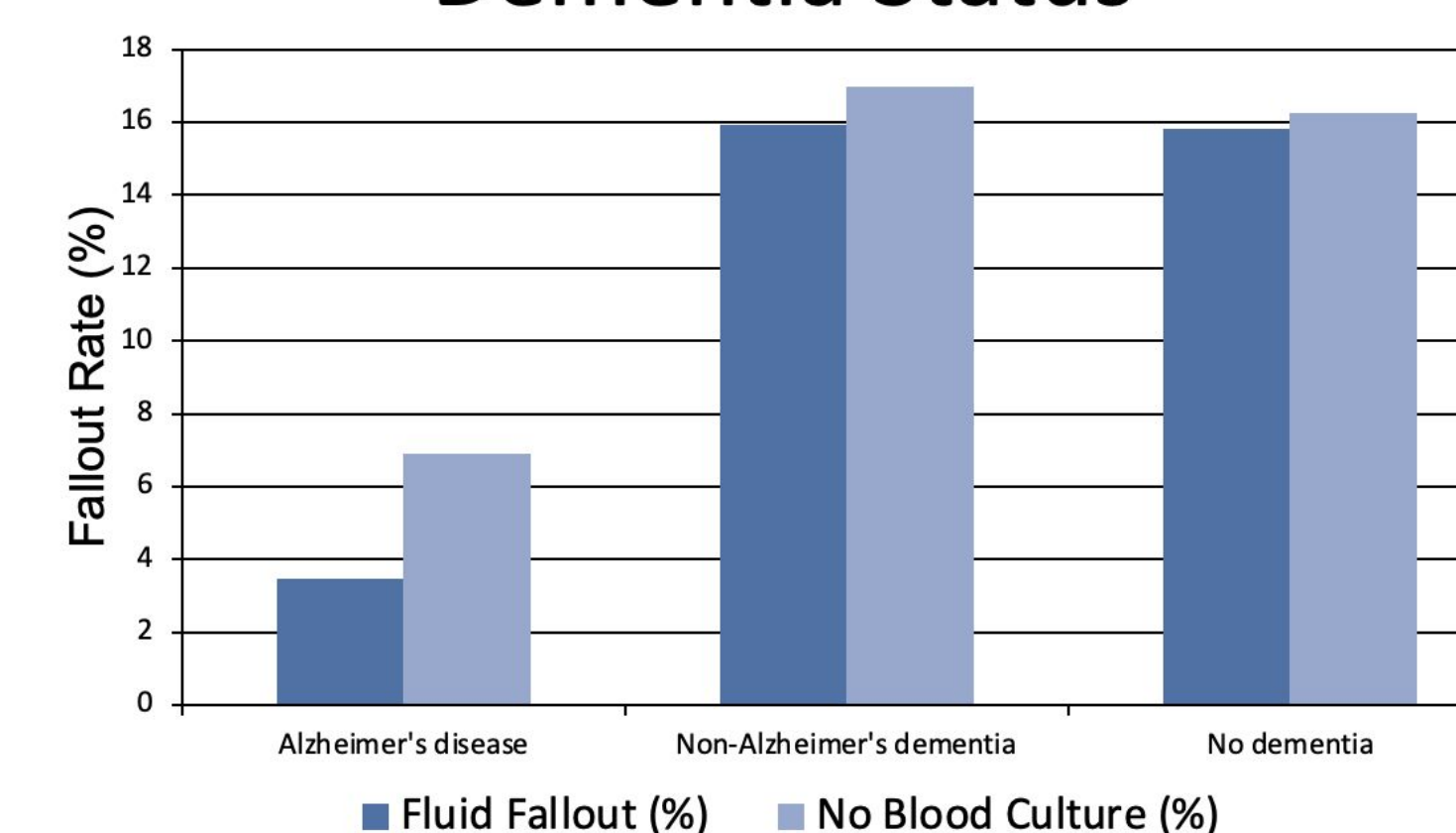
- Retrospective chart review of older adults hospitalized with sepsis within a large Metro Detroit health system between January 1 and December 31, 2023.
- Inclusion criteria: patients ≥ 65 years of age admitted with a diagnosis of sepsis.
- A total of 1,561 patients met inclusion criteria.
- Patients were stratified by documented dementia status (Alzheimer disease, non-Alzheimer dementia, and no dementia) to evaluate differences in outcomes and protocol adherence.
- Data were extracted from the electronic medical record system.
- Demographic variables collected included age, sex, and race.
- Clinical outcomes assessed were 30-day mortality and adherence to sepsis quality measures.
- Sepsis process-of-care measures included timely antibiotic administration, initial lactate measurement, fluid resuscitation, blood culture collection, and order set utilization.
- Between-group comparisons were performed to evaluate differences across dementia categories.
- Multivariable logistic regression was used to assess independent predictors of 30-day mortality, adjusting for age, gender, and race.
- Statistical significance was defined as $p < 0.05$.



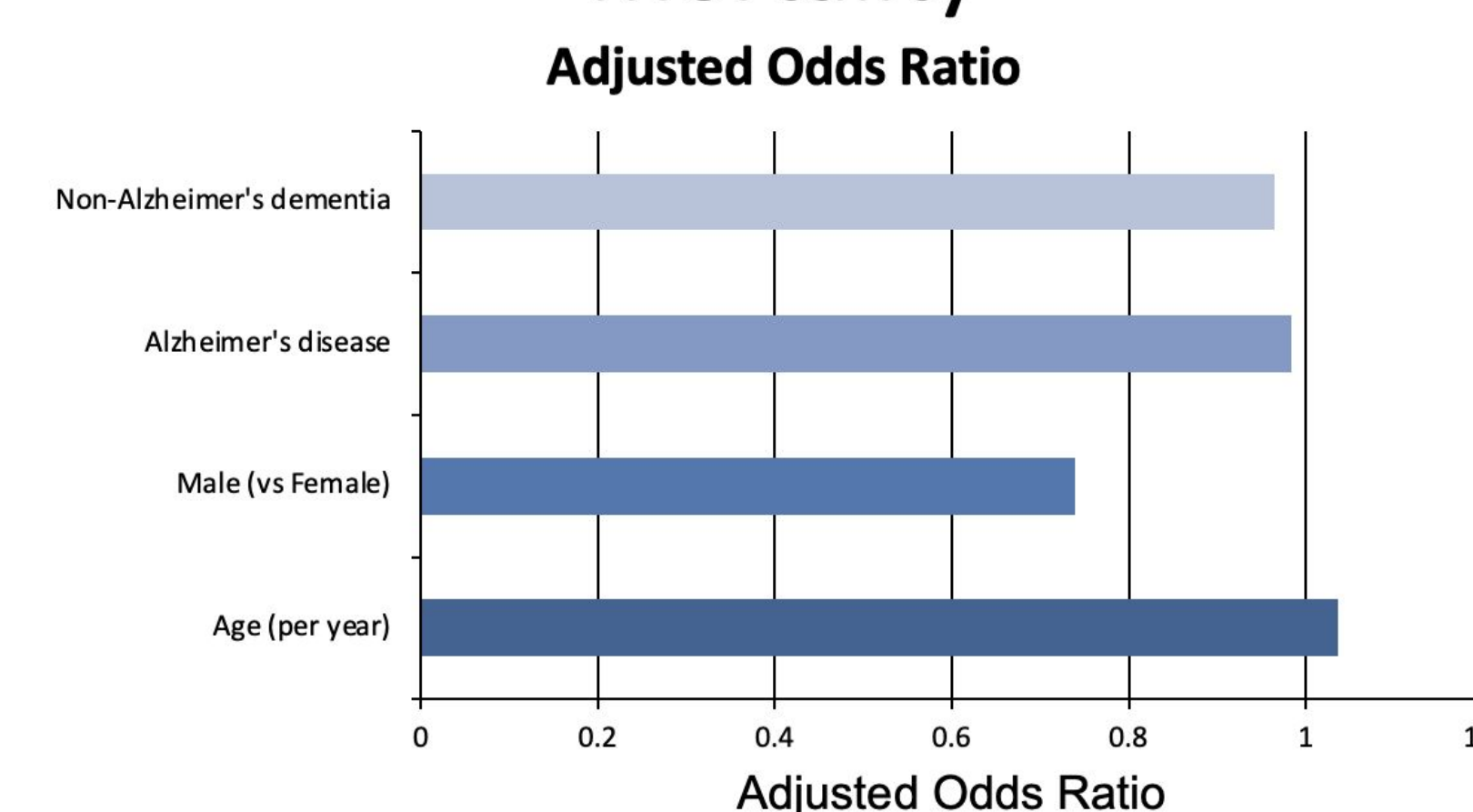
Results

- A total of 1,561 patients hospitalized with sepsis were analyzed.
- Patients with Alzheimer disease were older (median 82.5 years) compared to non-Alzheimer dementia (79 years) and no dementia (69 years), while gender and racial distributions did not significantly differ across groups.
- In unadjusted analysis, mortality differed across dementia categories, with the highest rate observed in Alzheimer disease (25.86%).
- However, in multivariable logistic regression adjusting for age, gender, and race, dementia status was not independently associated with 30-day mortality; increasing age was the strongest independent predictor of death.
- Process-of-care analysis demonstrated significantly higher rates of fluid resuscitation fallout ($p = 0.0085$) and blood culture fallout ($p = 0.0487$) among patients with Alzheimer disease.
- Other sepsis quality measures did not differ significantly between groups.

Sepsis Quality Measure Fallouts by Dementia Status



Adjusted Predictors of 30-Day Mortality



Conclusions

- In unadjusted analysis, 30-day mortality differed across dementia categories, with the highest mortality observed among patients with Alzheimer disease.
- After adjustment for age, gender, and race, dementia status was not independently associated with 30-day mortality.
- Age was the strongest independent predictor of mortality among patients hospitalized with sepsis.
- Patients with Alzheimer disease demonstrated significantly higher rates of fluid resuscitation and blood culture process fallouts.
- These findings suggest that differences in care processes, rather than dementia diagnosis alone, may contribute to outcome disparities.
- Targeted quality improvement initiatives focusing on protocol adherence and early recognition in cognitively impaired patients may help optimize sepsis care.
- As the aging population continues to grow, improving systems-based management of older adults with sepsis remains a clinical priority.

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