Possible Ageism in the Aggressiveness of Severe Sepsis Treatment

R.A. Ewing*, D.J. Heaton*, and L.S. Hale

Department of Physician Assistant, College of Health Professions

Abstract. Sepsis is an emerging concern among older adults, associated with high mortality. Evidence of possible ageism, in the form of less aggressive treatment, has been reported for other diseases. The goal of the study was to investigate whether age was a determining factor in aggressiveness of treatment for severe sepsis and to evaluate in-hospital mortality rates. A subanalysis of previously collected data was performed. This database contained 143 adult patients admitted to a 760-bed tertiary care teaching hospital from June 2004 to May 2005 with a diagnosis of severe sepsis and/or septic shock. Aggressiveness of treatment was measured by rates of compliance with the Society of Critical Care Medicine (SCCM) treatment guidelines and activation of the hospital’s sepsis response team (SRT). There were 73 patients in the older adult group (≥ 65 years) and 62 in the younger adult group (18 – 64 years). SRT was activated less often for older adults (19% vs. 41%, \( p = 0.008 \)), but treatment compliance rates were similar. In-hospital mortality was higher in the older adult group, 51% vs. 27%, \( p = 0.008 \), despite similar treatment compliance rates. The decision to activate the SRT is one indicator of aggressiveness of treatment. Neither age nor activation of the SRT appeared to be correlated with treatment compliance. Although treatment compliance was similar between groups, mortality was higher in the older adults.

1. Introduction

Some evidence suggests there may be a tendency to treat older patients less aggressively due to a perceived increased risk of side effects from treatment, reduction in expected treatment success, reduced life expectancy, and reduced life quality [1]. When these treatment decisions are independent of medical appropriateness or patient preference and seem to be based on age alone, it indicates ageism [2]. Ageism has been reported in cancer screening and treatment, prescribing of statin therapy, ICU admission and overall decision making for inpatients [3-5]. No literature could be located evaluating ageism in sepsis treatment.

Sepsis is body-wide inflammation resulting from infection. If inadequately treated, it may progress to severe sepsis, defined as sepsis plus organ failure, hypotension, or hypoperfusion.[6] Severe sepsis is nearly nine times more common in people ≥ 85 years as compared to younger adults with a 28.6% mortality rate overall and 38.4% mortality in those ≥ 85 years [7].

The Society of Critical Care Medicine (SCCM) has developed specific evidence-based treatment guidelines for optimal management of severe sepsis. Successful, aggressive treatment relies heavily upon early diagnosis and timely implementation of interventions. One way to improve treatment may be to use a Sepsis Response Team (SRT). The SRT consists of providers who are paged to the patient’s bedside where they rapidly assess the patient and initiate appropriate, aggressive, and timely treatment. In June 2004, Wesley Medical Center (WMC) developed a SRT to manage severe sepsis with a goal of reducing sepsis-related mortality.

A large-scale retrospective study was completed at WMC to compare mortality and compliance with the SCCM guidelines in patients treated by the SRT as compared to those treated by individual physicians (non-SRT group). Early analysis showed that the mean age of patients in the SRT group was significantly lower than the non-SRT group, 54 ± 15 vs. 74 ± 16, \( p = 0.01 \). The patient’s attending physician made the medical decision whether or not to activate the SRT. This raised the question of the possibility of ageism. Were physicians more likely to activate the SRT in younger rather than older patients?

2. Methods, Results, Significance

Methods: A subanalysis of previously collected data was performed on a database of 143 adult patients admitted to a 760-bed tertiary care teaching hospital from June 2004 to May 2005 with a diagnosis of severe sepsis and/or septic shock. Aggressiveness of treatment was measured by compliance with the SCCM treatment guidelines and activation of the hospital’s SRT.

Data Analysis and IRB Approval: Statistical significance was set at \( p \leq 0.05 \). Descriptive data were reported using means ± standard deviation or percentages as appropriate. Means were compared
using *t* tests and ANOVA as appropriate. Frequency data were compared using the Chi square test or Fisher’s exact test where appropriate. This project was approved by the WSU and Wichita Medical Research and Education Foundation Institutional Review Boards.

**Data Collection Team:** A critical care surgeon, two pharmacists, a physician assistant (PA), a statistician, and four Master of PA students comprised the data collection team. The surgeon, one pharmacist, and the PA were members of the WMC SRT.

**Results, Patient Characteristics:** Of the 143 patients evaluated in this sub-analysis, 73 were in the older adult group (≥ 65 years), 62 in the younger adult group (age 18 – 64 years), and 8 were excluded due to missing data. The older and younger adult groups were similar with regards to sex, race, and diseases as indicated by ICD-9 codes. The mean APACHE II score for the older adult group was higher than the younger adults, 27.4 ± 8.12 vs. 24.3 ± 10.23, *p* = 0.05. The overall percentage of patients within each of the four APACHE II quartiles were similar, *p* = 0.41. However, the older adult group did have a significantly smaller percentage of patients in quartile 1 indicating a lower expected mortality rate (13.9% vs. 25.4%, *p* = 0.4) and a higher percentage of patients in quartile 4 indicating a higher expected mortality rate (36.1% vs. 28.8%, *p* = 0.406).

A higher percentage of older adults held a DNR status, 34.2% vs. 6.5%, *p* < 0.001. Mean age of the older adult group was 77.2 ± 8.9 years with 45.2% females. A majority of older adults were admitted from home (70%). Nursing home admissions were 18%, 4% from an assisted living facility and 4% from another hospital, indicating some level of frailty. The length of total hospital stay was similar for the older and younger adult groups, 12.9 ± 13.07 vs. 12.9 ± 9.44 days, *p* = 0.98, as was the length of CCU stay, 9.0 ± 13.16 vs. 8.7 ± 9.12 days, *p* = 0.86, respectively.

**Results, Aggressiveness of Treatment and Mortality:** Although a significantly lower percentage of older adults received treatment by the SRT (19.2% vs. 40.8%, *p* = 0.008), overall treatment compliance rates were similar. Although compliance with some elements of the 6-hour treatment bundles were good, overall compliance rates were low in both the younger and older groups, 2% vs. 4%, *p* = 0.39. Similarly, although some elements of the 24-hour treatment bundles had good compliance rates, no patients were in full compliance with all the elements in either group. There were no statistically significant differences seen in rates of compliance with the SCCM treatment bundles except for 24-hour glucose control. A higher percentage of older adults did achieve 24-hour glucose control goals than in the younger adults (41% vs. 24%, *p* = 0.04. In-hospital mortality was higher in the older adult group, 50.7% vs. 27.4%, *p* = 0.008.

**Discussion:** Lower rates of SRT activation in older adults may indicate ageism, but other factors such as physicians’ unawareness of the SRT, physicians’ comfort level with self-treating sepsis, or unrecognized sepsis severity cannot be ruled out. Severe sepsis in older adults presents a diagnostic challenge for clinicians in that the typical signs and symptoms may be blunted, thus masking the severity of disease and possibly delaying aggressive treatment [7].

**Clinical Significance:** Although this study was unable to clearly demonstrate ageism, it did demonstrate poor overall compliance with the SCCM treatment guidelines. With this evidence of low compliance, WMC may be able to perform further research to determine why compliance is so low, and how they can improve it, such as increasing awareness or educating the providers on the bundle branch components.

**3. Conclusion**

The decision to activate the SRT is one indicator of aggressiveness of treatment. Lower rates of SRT activation in older adults may indicate ageism, but other factors cannot be ruled out. Neither age nor activation of the SRT appeared to be a factor in SCCM treatment compliance. Although treatment compliance was similar between groups, mortality was higher in the older adults.

**4. Acknowledgements**

We thank the other members of the WMC SRT: DG Vasquez, DO; DA Moran, PharmD; SM Nyberg, MHS, PA-C; GM Berg-Copas, PhD(C); and AD Bansemer and MR Koch, Master of PA students. This study was funded through the WSU Regional Institute on Aging and the WSU Graduate School.