



Impact of early do-not-attempt-resuscitation orders on procedures and outcomes of severe sepsis^{☆,☆☆}



Neza N. Sarkari, BS^{a,b}, Sarah M. Perman, MD, MSCE^a, Adit A. Ginde, MD, MPH^{a,*}

^a Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO

^b Case Western Reserve University School of Medicine, Cleveland, OH

ARTICLE INFO

Available online xxx

Keywords:

Sepsis

Resuscitation orders

Hospital mortality

Advance directives

Medical futility

Procedures

ABSTRACT

Purpose: Do-not-attempt-resuscitation (DNAR) orders are common in severe sepsis, but the impact on clinical care is not known. Our primary objective was to determine the impact of early DNAR orders on in-hospital mortality and performance of key interventional procedures among severe sepsis hospitalizations. Our secondary objective was to further investigate what patient characteristics within the sepsis DNAR population affected outcomes.

Methods: Using the 2010–2011 California State Inpatient Dataset, we analyzed hospitalizations for adults admitted through the emergency department with severe sepsis. Our primary predictor was a DNAR order, and our outcomes were in-hospital mortality and performance of interventional procedures.

Results: Visits with early DNAR orders accounted for 20.3% of severe sepsis hospitalizations. An early DNAR order was a strong, independent predictor of higher in-hospital mortality (odds ratio [OR], 4.03; 95% confidence interval, 3.88–4.19) and lower performance of critical procedures: central venous line (OR, 0.70), mechanical ventilation (OR, 0.80), hemodialysis (OR, 0.61), and major operative procedure (OR, 0.46). Among those with early DNAR orders, older age and rural location were the strongest predictors for a lack of interventional procedures.

Conclusion: Although DNAR orders are not synonymous with “do not treat,” they may unintentionally limit aggressive treatment for severe sepsis patients, especially in older adults.

© 2016 Elsevier Inc. All rights reserved.

1. Introduction

Severe sepsis requires high-intensity resource utilization and results in high short-term mortality and substantial long-term morbidity among survivors [1,2]. Clinical trials show that protocol-based early goal-directed therapy in sepsis does not significantly improve mortality outcomes compared with usual care [3–5]. However, even if it is not protocol based, early aggressive supportive care is still recommended because it improves survival [6,7]. A do-not-attempt-resuscitation (DNAR) order, which is a legal document that respects the patient's wishes to avoid cardiopulmonary resuscitation in the event of cardiac

or pulmonary arrest, could prevent the aggressive supportive care that patients in severe sepsis require to optimize clinical outcomes.

Research in different areas of medicine has found that a DNAR order is independently associated with increased mortality [8–10]. One explanation for this is that an early DNAR order may limit critical hospital interventions [11]. However, many DNAR patients and their families may still want treatment associated with improved mortality and quality of life including central venous lines for vasoactive medications, short-term mechanical ventilation for acute respiratory failure, and hemodialysis. Little is known regarding how treatment is affected in septic patients with an early DNAR order. A prior single-center study found that DNAR orders in severe sepsis were associated with higher mortality but similarly aggressive therapy [12]. However, whether a DNAR order influences critical interventions in patients with severe sepsis is unknown, as well as what patient-level characteristics among those with DNAR are associated with outcomes.

We sought to further compare treatment intensity and patient outcomes by early DNAR status among severe sepsis hospitalizations. The first objective of this study was to compare mortality and interventional procedures (mechanical ventilation, central catheter placement,

☆ Presentations: Presented in abstract/poster form at the 2014 American College of Emergency Physicians Research Forum; Chicago, Ill.

☆☆ Sources of support: None to report.

* Corresponding author at: Department of Emergency Medicine, University of Colorado School of Medicine, 12401 E. 17th Ave, B-215, Aurora, CO 80045. Tel.: +1 720 848 6777; fax: +1 720 848 7374.

E-mail addresses: nns12@case.edu (N.N. Sarkari), sarah.perman@ucdenver.edu (S.M. Perman), adit.ginde@ucdenver.edu (A.A. Ginde).

hemodialysis, and operating room procedures) among severe sepsis patients who have or do not have an early DNAR order. The second objective was to determine characteristics associated with mortality and interventional procedures within the severe sepsis DNAR population.

2. Methods

We performed a cross-sectional analysis of the 2010–2011 California State Inpatient Dataset (SID) from the Healthcare Cost and Utilization Project. This data set includes all inpatient discharges in the state annually. California was selected for this analysis because of its large, diverse population and the unique presence of an early DNAR order as a variable. The Colorado Multiple Institutional Review Board approved this study as “not human subjects” research.

2.1. Inclusion and exclusion criteria

We identified our cohort of severe sepsis patients using explicit *International Classification of Disease, Ninth Revision* hospital discharge diagnosis codes for severe sepsis (995.92) and septic shock (785.52) in any of the 25 listed fields that were listed as present on admission. There were 135 215 visits for severe sepsis or septic shock visits during the 2 years. We excluded children (age <18 years; n = 720) and visits not admitted through the emergency department (ED; n = 17 611) such as direct transfers to the inpatient setting. Emergency department visits that resulted in discharge or death before inpatient admission are not included in the SID. After excluding n = 11 additional hospitalizations with missing early DNAR status, the final sample size for the analysis was 116 873 visits.

2.2. Primary outcome and covariate definitions

Our primary outcome was in-hospital mortality. Our secondary outcomes were performance of critical procedures based on their *International Classification of Disease, Ninth Revision* codes: central venous line (38.93, 89.62, 38.95, 38.97), mechanical ventilation (96.70, 96.71, 96.72, 96.04, 96.05, 93.90, 93.91), hemodialysis (38.95, 39.95), and major operating room procedures (coded explicitly in SID). Central venous line placement and vasoactive medications are a mainstay of aggressive management of septic shock [7]. Mechanical ventilation is a key intervention for acute respiratory failure, and hemodialysis is crucial for recovery for patients with acute kidney injury from septic shock. Lastly, operating room procedures are recommended for adequate source control.

Our primary explanatory variable was establishment of a DNAR order within the first 24 hours of hospitalization, coded explicitly in California SID (could be a new DNAR order or reordering of an established order). The database did not include whether or not the patient expressed other limitations of care along with the DNAR order. Our key covariates included age, sex, race/ethnicity, primary payer source, median household income, hospital urban–rural location, comorbidities, weekend admission, and admission from skilled nursing facility.

2.3. Statistical analysis

We first analyzed key variables stratified by DNAR status using descriptive statistics. Next, we performed a multivariable logistic regression with DNAR status as the primary independent variable and demographics, comorbidities, hospital urban–rural location, weekend admission, and admission from skilled nursing facility as covariates. Each outcome of interest was modeled separately, including in-hospital mortality, central venous line, mechanical ventilation, hemodialysis, and operating room procedures. In the mortality model, we also included the procedure outcomes as independent variables. As secondary analyses, we also performed multivariable models for these outcomes restricted only to the subgroup with an early DNAR order to evaluate the characteristics within the DNAR population that is

associated with their mortality and procedural outcomes. All hospitalizations in California were included in the data set; thus, no sample weighting was necessary. The analyses were performed using Stata 12.1 (Statacorp, College Station, TX).

3. Results

Among 116 873 California adult ED visits in 2010 to 2011 hospitalized for severe sepsis and septic shock, 23 770 (20.3%) visits had an early DNAR order. Patients hospitalized with an early DNAR order were more likely older, female, non-Hispanic white, with Medicare, and admitted from a skilled nursing facility (Table 1). Comorbid conditions that were more common among early DNAR visits included congestive heart failure, lymphoma, metastatic cancer, renal failure, and solid tumors without metastasis.

Among visits with early DNAR orders, 46.3% died in the hospital compared with 21.2% of patients without DNAR orders (Table 2). Visits with an early DNAR order, compared with those without, also had lower performance of critical procedures including central venous line (37.6% vs 50.7%), mechanical ventilation (32.6% vs 41.4%), hemodialysis (6.3% vs 13.1%), and major operating room procedure (6.2% vs 15.5%), as well as shorter hospital length of stay and total charges (Table 2).

Table 1
Characteristics of severe sepsis visits with and without early DNAR orders

Characteristics	No DNAR		DNAR	
	n	%	n	%
Total	93 103	79.7	23 770	20.3
Demographics				
Age (y), median (IQR)	69	(57–81)	82	(72–87)
18–59	28 283	30.4	2432	10.2
60–69	18 970	20.4	2727	11.5
70–79	20 216	21.7	4862	20.5
80–89	22 068	23.7	10 662	44.9
≥90	3552	3.8	3087	13.0
Female sex	45 455	48.9	12 708	53.5
Race/Ethnicity				
Non-Hispanic white	49 394	55.2	15 801	68.6
Non-Hispanic black	9323	10.4	1315	5.7
Hispanic	20 430	22.8	3409	14.8
Asian or Pacific Islander	8509	9.5	2162	9.4
Other	1895	2.1	355	1.5
Expected primary payer				
Private insurance	14 275	15.3	2012	8.5
Medicare	58 889	63.3	19 527	82.2
Medicaid (Medi-Cal)	14 651	15.7	1774	7.5
Self-pay	2796	3.0	225	1.0
Other	2487	2.7	231	1.0
Median household income				
1st quartile	27 050	29.7	5079	21.7
2nd quartile	23 464	25.7	5802	24.8
3rd quartile	22 992	25.2	6379	27.3
4th quartile	17 695	19.4	6148	26.3
Hospital location				
Large urban	74 214	80.5	18 700	79.6
Small urban	17 107	18.6	4391	18.7
Rural	902	1.0	396	1.7
Clinical				
Chronic medical conditions, median (IQR)	7	(5–10)	8	(5–10)
Alcohol abuse	6105	6.6	989	4.2
Congestive heart failure	26 278	28.2	7535	31.7
Chronic lung disease	25 944	27.9	6449	27.1
Diabetes mellitus	37 127	39.9	7852	33.0
Liver disease	8617	9.3	1638	6.9
Lymphoma	1861	2.0	519	2.2
Metastatic cancer	4655	5.0	2015	8.5
Obesity	12 427	13.4	1565	6.6
Renal failure	30 036	32.3	7760	32.7
Solid tumor without metastasis	3747	4.0	1224	5.2
Weekend admission	25 077	26.9	6516	27.4
Admission from skilled nursing facility	14 786	15.9	6136	25.8

IQR indicates interquartile range.

Download English Version:

<https://daneshyari.com/en/article/2764377>

Download Persian Version:

<https://daneshyari.com/article/2764377>

[Daneshyari.com](https://daneshyari.com)