

Awareness and implementation of sepsis guidelines in Kansas hospitals

¹Matthew Steadham*, ¹Sue Nyberg, MHS, PA-C, ²Gina Copas, PhD (c),
¹Audrey Griffin, PA-C

¹Department of Physician Assistant, College of Health Professions, ²University of Kansas School of Medicine – Wichita

Abstract. *Introduction:* In 2002 the Surviving Sepsis Campaign was established by an international consortium of healthcare providers as a collaborative effort to reduce mortality from the life-threatening conditions of severe sepsis and septic shock. Resuscitation and treatment guidelines (“Early Goal-Directed Therapy – EGDT”) were developed based on existing literature. There is very little published data evaluating awareness of these guidelines and the capability to implement them in smaller, rural hospitals. This descriptive study was conducted to assess awareness and capability for implementation of EGDT in rural, Kansas hospitals. *Methods:* A survey tool was designed and mailed to the medical director of the emergency department (ED) in all 129 Kansas hospitals. Non-responders received a second survey, also by mail. *Results:* Only 25% of respondents were aware of EGDT. Awareness and implementation of the Surviving Sepsis Campaign early goal-directed treatment recommendations is low while the capability of facilities to perform the individual components of these recommendations is high.

1. Introduction

Sepsis is when the body’s natural immune system goes into overdrive in response to infection or trauma. This sets off a cascade of events that can lead to widespread inflammation and blood clotting in tiny vessels throughout the body. It has been demonstrated that the mortality rate for severe sepsis can range anywhere from 20-80% with an analyzed average of 49.7%. [1,2] The incidence of sepsis is increasing across all demographic groups at an average rate of 8.7% per year. [3] Rivers et al. (2001) published a ground breaking study that found there was a 16% reduction in absolute 28-day mortality when starting early goal-directed therapy in a septic patient presenting in the emergency department. [4] In addition, Shorr et al. (2007) recently published that the average cost of care per patient was reduced by over \$5,800 when an evidence-based protocol for sepsis treatment was implemented. [5]

The Surviving Sepsis Campaign was formed in 2002 by representatives of 11 internationally recognized medical organizations with the goal of reducing sepsis mortality 25% by the year 2009. Dellinger et al. (2004) published the “Surviving Sepsis Campaign guidelines for management of severe sepsis and septic shock.” [6] The emergency department is often the first link in the chain of care for a patient with sepsis. As many as 61% of all patients meeting sepsis criteria initially present to the emergency department for care. [7] Despite the proven efficacy of the components of early goal-directed therapy and the existence of evidence based protocols, accurate and timely implementation of these recommendations remains low in the emergency department. [8, 9] It has been shown that implementation of early goal-directed therapy is feasible in the emergency department. [10]

The extent to which awareness and implementation of Surviving Sepsis Campaign guidelines has disseminated to U.S. hospitals is largely unknown, especially in the rural setting. The wide variation in the size of Kansas hospitals provides an excellent setting to investigate the dissemination of sepsis treatment guidelines. Identifying the key characteristics of facilities demonstrating an awareness of and the ability to implement the latest treatment protocols is essential to developing effective strategies for further outreach.

2. Methods

This descriptive, cross-sectional study was conducted between August and December 2007. A survey tool was developed and mailed to the medical director of the emergency department in all 129 Kansas hospitals. The research team believed that ED directors would be most knowledgeable about the treatment of sepsis and hospital capability to implement specific sepsis treatments. Non-responders received a second survey, also by mail. The survey tool was designed to collect data in six categories: hospital characteristics, the capability to obtain lab tests on an urgent basis, the capability to initiate procedures on an urgent basis, the use of Activated Protein C (Xigris), the awareness of sepsis treatment guidelines, and the development of sepsis treatment

protocols. All responses were de-identified and the data were analyzed utilizing standard statistical measures (SPSS).

3. Results

Of the 129 surveys mailed, 50 were returned for a response rate of 38.8%. The majority of respondents (62%) reported their role as either Medical Director of the emergency department (ED) or intensive care unit (ICU). Only 1 hospital (2%) reported having an established protocol for sepsis treatment currently in place, with an additional 14 hospitals (28.6%) reporting protocols in the process of development. A minority of the respondents (24.5%) reported being familiar with EGDT as promoted by the SSC. Only a slight majority of hospitals (54%) have the capability to obtain serum lactate and insert central venous catheters which are key components in the identification and initial treatment of sepsis. The capability of facilities to perform the individual components of early goal-directed therapy is shown in Table 1.

Table 1:
The percentage of respondents that were capable of obtaining or implementing the following within six hours of the patient's arrival to the hospital

Diagnostic studies		Procedures	
Complete blood count	98%	Initiation of broad spectrum antibiotics	98%
Metabolic profile	98%	Initiation of intravenous medication drips	96%
Blood gas	86%	Placement of central venous catheter	54%
Blood culture	78%	Measurement of:	
Lactic acid	54%	central venous pressure	38%
Serum cortisol	30%	mixed venous oxygen saturation	32%
Cortisol stimulation test	22%	continuous central venous oxygen saturation	24%
Gram stain	68%	intermittent central venous blood gas	36%
Coagulation studies (PTT, PT, INR)	98%		

4. Conclusions

Awareness and implementation of Surviving Sepsis Campaign guidelines for treatment of sepsis in Kansas hospitals is low. In addition, not all hospitals are fully capable of implementing all recommended aspects of EGDT. Awareness and implementation of guidelines for the treatment of sepsis, including EGDT, is lower than expected in hospitals in Kansas. Additional education of healthcare providers may be needed to raise awareness of sepsis guidelines and to facilitate increased implementation in Kansas hospitals.

5. References

- [1] Friedman G. Has the mortality of septic shock changed with time. *Crit Care Med.* 1998;26:8.
- [2] Wheeler A. Treating patients with severe sepsis. *N Engl J Med.* 1999;340:7.
- [3] Martin GS, Mannino DM, Eaton S, Moss M. The epidemiology of sepsis in the United States from 1979 through 2000. *N Engl J Med.* Apr 17 2003;348(16):1546-1554.
- [4] Rivers E, Nguyen B, Havstad S, et al. Early goal-directed therapy in the treatment of severe sepsis and septic shock. *N Engl J Med.* Nov 8 2001;345(19):1368-1377.
- [5] Shorr AF, Micek ST, Jackson WL, Jr., Kollef MH. Economic implications of an evidence-based sepsis protocol: can we improve outcomes and lower costs? *Crit Care Med.* May 2007;35(5):1257-1262.
- [6] Dellinger RP, Carlet JM, Masur H, et al. Surviving Sepsis Campaign guidelines for management of severe sepsis and septic shock. *Crit Care Med.* Mar 2004;32(3):858-873.
- [7] Huang DT, Clermont G, Dremsizov TT, Angus DC. Implementation of early goal-directed therapy for severe sepsis and septic shock: A decision analysis. *Crit Care Med.* Sep 2007;35(9):2090-2100.
- [8] Carlborn D. Barriers to implementing protocol-based sepsis resuscitation in the emergency department - Results of a national survey. *Crit Care Med.* 2007;35(11):7.
- [9] Sivayoham N. Management of severe sepsis and septic shock in the emergency department: a survey of current practice in emergency departments in England. *Emerg Med J.* Jun 2007;24(6):422.
- [10] Nguyen HB, Corbett SW, Steele R, et al. Implementation of a bundle of quality indicators for the early management of severe sepsis and septic shock is associated with decreased mortality. *Crit Care Med.* Apr 2007;35(4):1105-1112.