Severe Sepsis: A Change in Practice?

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INTRODUCTION: Beginning in 2001, evidence emerged that early aggressive fluid resuscitation and faster time to antibiotics are key determinants in decreasing mortality in severe sepsis and septic shock. Guidelines have since been developed based upon these findings. Despite a sustained, vigorous campaign to promote these guidelines, it is not clear how integrated these recommendations have become into standard practice.

SPECIFIC AIMS: To compare the treatment of patients presenting to Yale with severe sepsis or septic shock during two time periods, one preceding and one following the introduction of new evidence based guidelines, focusing on speed and volume of fluid resuscitation as well as time to antibiotics.

HYPOTHESIS: The introduction of evidence based guidelines has been associated with more aggressive fluid management and faster time to infusion of antibiotics in patients with severe sepsis and septic shock.

METHODS: Retrospective study looking at two discrete one year timeframes: 07/01/1999-06/30/2000 and 07/01/2004-06/30/2005. Candidate charts were screened by utilizing ICD9 codes sepsis: 0380 - 0389, SIRS: 99590, 99591, 99592 and bacteremia: 7907 during the respective years. Patients were included for study if they met Society for Critical Care Medicine (SCMM) criteria for either severe sepsis and/or septic shock upon presentation to the emergency department (ED) and were directly admitted to the medical intensive care unit (MICU). Exclusion criteria were age <18 years old, DNR/DNI orders or end stage renal disease (dialysis). Primary endpoints were the time intervals between triage and antibiotic and fluid administration and the volumes of fluid administered at clinically relevant time intervals of 0-6 hours and total fluid in 24 hours. Secondary endpoints evaluated included mortality, length of stay, need for intubation, central line use, use of pressors, inotropes and need for blood transfusions.

RESULTS: 66 patients were identified in the 2004 cohort, 20 in 2000. Baseline characteristics were similar between the two groups. Mean APACHE II was 25 +/-7 in the 2004 cohort and 23 +/- 7 in the 2000 group (p = NS). Mean MEDS score was 10 +/-4 for both years. Comparing 2004 to 2000, there had been a statistically significant decrease in time to antibiotics after triage: 87 min. (IQR 54, 137) versus 142 min (IQR 67, 222; p=0.03) and a trend towards faster initiation of fluids: 31 min (IQR 18, 59) versus 40 min. (IQR 30, 106; p=0.07). There was also a trend towards more IVF administration in the first 6 hours: median 4000 ml (IQR 2475, 6161) vs. 3000 ml (IQR 1813, 5000; p=0.12) and overall: median 10204 ml (IQR 7895, 12881) vs. 8762 (IQR 5862, 10955; p= 0.06). A decrease in mortality was seen in the 2004 cohort, but the difference was not statistically significant (32% versus 40% p= 0.59.) There were no significant differences between other secondary endpoints, including length of stay.

CONCLUSION: This study shows that there has been a statistically significant decrease in time to administration of antibiotics and a trend towards faster initiation of fluids, which suggests there is a trend towards a more aggressive approach to treating patients with severe sepsis and septic shock. A larger study is warranted to determine if these changes are associated with meaningful outcome advantages and to identify the factors that determine which patients are more likely to get aggressive care.