Prehospital Identification of Sepsis Patients and Alerting of Receiving Hospitals – the Impact on Early Goal Directed Therapy

Purpose: This study aims to determine how effectively Emergency Medical Technicians and paramedics can use a screening tool to identify potential sepsis patients in order to provide an alert to the receiving hospital. Secondly, the study examined whether an early identification process in the field leads to improved treatment of sepsis with the end goal to reduce morbidity and mortality of sepsis patients in the hospital setting.

Methods: EMTs and paramedics (BLS and ALS) were asked to use Systemic Inflammatory Response Syndrome (SIRS) criteria to ascertain if a patient was potentially septic. Enrolled patients were compared to retrospective controls at two facilities. Sepsis patients were identified by admission diagnosis of sepsis, urosepsis, or septic shock. A retrospective matched case-control design (1:1 match) was conducted where pre-identified sepsis cases were compared to an equal number of age/diagnosis matched controls from the calendar year prior to the study period.

Results: 175 Hospital A patients and 67 Hospital B patients were identified by prehospital personnel as meeting SIRS criteria. 63 Hospital A and 56 Hospital B patients ended up having a discharge, principal or admitting ER diagnosis of sepsis. The tool had a sensitivity of 78% and a specificity of 21%. At Hospital B, on average, pre-identified patients received significantly faster fluids (85.4 ± 90.3 vs. 37.8 ± 26.9 minutes, p=0.0014) and lactate (146.9 ± 138.5 vs. 51.9 ± 59.2 minutes, p<0.0001), compared to controls. There were no significant differences in time to antibiotics between patients pre-identified and not pre-identified (102.6 ± 144.1 and 95.2 ± 101.2 minutes respectively, p=0.77). When comparing matched cases and controls at both facilities (n=113 each), cases were 65% significantly less likely to have an in-hospital mortality than controls (9.7% mortality rate vs. 7.1% mortality rate); R.R. 0.35, 95% C.I. 0.15-0.79.

Conclusion: BLS and ALS prehospital providers are capable of accurately identifying potential sepsis patients. There was a significant decrease in mortality after program implementation. At one hospital, alerts led to faster initiation of lactate measurement and fluids. Study limitations included small sample size, differing data methodologies, EMS education challenges, and inadequate EMS temperature monitoring.