‘E’ For Emergent: An Analysis of the Use of Prehospital Red Lights and Sirens (RLS) and Time to Antibiotic Administration in Sepsis Alert Patients

Lead Author: William Forrester Taber
Category: Medical Student Presentation

Research Team:
Background

- Sepsis causes 1 in 5 deaths globally
- Antibiotic administration should occur within one hour of presumed diagnosis of sepsis or septic shock
- Current efforts focus on hospital interventions with limited studies exploring the role of prehospital care
- Protocols for sepsis vary widely depending on region, and while EMS is equipped to stabilize and resuscitate septic patients, most do not carry antibiotics making most focus on rapid transport, often emergently
- There is significant risk in using Red Lights and Sirens (RLS) with a 2.4 times higher risk of accidents/collisions
- Early estimates of EMS data in our region suggested an average of 2 minutes time saved running RLS
- Is the benefit of saved minutes worth the inherent risk, or can EMS improve their outcomes another way?
Retrospective study

- “Sepsis Alert” patients being transported by SCFD
- SMH admission and SCFD transport data
- October 2019 - March 2020
  - Covid-19 many sepsis patients became “Med Alerts”
- Number of patients: 223
- Minimum age: 19 Years Old
- Maximum age: 105 Years Old
- Median age: 78 Years Old
- Sepsis patients were transported emergently 94% of the time
- There was no significant different between travel time

Average Time to Antibiotic Administration

- P = 0.448

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<th>RLS</th>
<th>Non RLS</th>
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<tr>
<td>Minutes</td>
<td>112</td>
<td>125</td>
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Time to Antibiotics (Minutes)
Prospective Study Methods

- Based on our preliminary results, our study was extended to implement a schedule for sepsis patient transport placed in every Sarasota County Ambulance.
- Prospective Randomized Cohort Study, partnered with Sarasota County Fire Department.
- Patients transported emergently on even days of the month, and non-emergently on odd days of the month (see sample calendar).
- Patients meeting SIRS criteria transported by EMS during May-October 2021.
Prospective Study Results/Discussion

- Results suggest that while there is a significant difference between RLS and non-RLS transport, the time saved occurs at the hospital rather than any pre-hospital events.

- This points to the initial hospital report, paramedic handoff, and effective patient advocacy having the most significant impact on these patients' hospital course.

- Furthermore, while at present most paramedics learn a majority of this in preceptorships, with greater emphasis on assessment, triage, and handoff EMS can provide all the benefits of RLS without the added risk to crews or patients.

- Data collection and analysis is ongoing and includes accuracy of sepsis identification in the field, frequency and type of prehospital interventions, as well as looking at existing assessment, and handoff procedures.

- This study is a promising and exciting opportunity to better understand just how vital quality pre-hospital care is to a patient’s clinical course and disposition. In the coming months we will begin deeper analysis which includes antibiotics selection, patient disposition, as well as morbidity and mortality.

Figure 1: (a), (b), (c): Box whisker plots in minutes showing IQR 1.3. Median (X), Total n=52, emergent n=31, non-emergent: n=20 (a) Emergent: 98.8, non-emergent 140.6, difference: 41.8, p<0.05 (b): Emergent: 26.3, non-emergent: 27.8, difference: 1.5, p>0.05 (c) Emergent: 72.8, non-emergent: 112.9, difference: 40.3, p<0.05 (d) Bar graph with confidence intervals comparing the impact on transport time on time to antibiotics administration.