Research Week 2021

A Retrospective Review of the Shock Index in Sepsis Alert Patients

Northeast Georgia Health System

Sepsis Impact in the United States

- Sepsis is a global concern but in the US approximately 1.7 million adults develop sepsis every year.
- 270,000 Americans die from sepsis annually
- Annual cost in the US is over $20 billion
- Early recognition aids in timely administration of fluid resuscitation and antibiotic initiation
- Previous research shows a correlation in elevated shock index scores and elevated lactate levels in sepsis
- The Shock Index (SI) is a low cost tool that was first introduced in 1967 for use in adult patients.
- The SI is calculated by dividing the heart rate by the systolic blood pressure.
- The normal range is 0.5 to 0.7in healthy adults.

Heart Rate
Systolic B/P

Example: A patient with a heart rate of 90 and a systolic blood pressure of 100 will have a SI of 0.9.
90/100 = 0.9

PICOT Question

Would it be helpful to have a calculated Shock Index as part of the Sepsis Screening in the Adult Emergency Department Triage process prior to lactate level completion to aid in early recognition of Sepsis?

Method

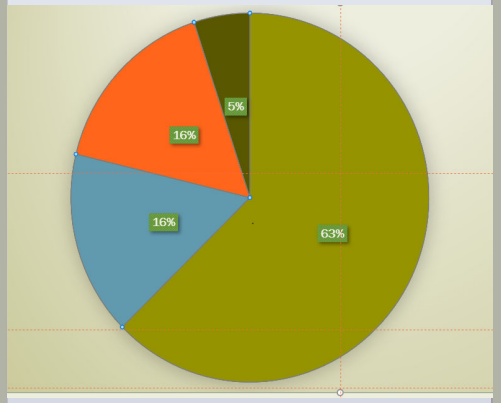
- This was a retrospective chart review of patients entering the Emergency Department of NGMC Barrow that met Nuance Sepsis Registry Criteria from July 2019 to July 2020.
- This included 65 patients in the registry over age 18 – 2 excluded due to no lactate level, 2 excluded due to atrial fibrillation, and 3 excluded because of sepsis presenting later in the admission.
- 61 patients had a data review of blood pressure, heart rate, temperature, lactate level, mode of arrival, and whether the ED sepsis screen was completed.
- The Shock Index was calculated retrospectively from the vital signs and compared to the lactate level

Results

- 38 of the 61 patients had a shock index over 0.7 with a correlating blood lactate level over 2.0 62% AND 21 of those 61 patients had a shock index over 1 (55%). # of these patients did not have a documented temperature. 18 of the remaining 35 patients presented with a temperature over 100.1 F (51%) while 17 patients had a temperature less than 100.1F (49%).
- 10 patients had a SI over 0.7 but the lactate was noted as less than 2. 6 of those patients had a temperature over 100.1F (60%) and 4 had a temperature less than 100.1F (40%).
- 13 patients had a shock index less than 0.7. 10 of these patients had a lactate level over 2 (77%) with 8 (62%) of those patients having a temperature over 100.1 F. 3 of the thirteen patients had a lactate less than 2 and only 1 of those patients had a temperature over 100.1F.

Conclusion

- This study was limited by the low volume of patients noted to be in the sepsis registry as well as review being limited to only patients noted to have sepsis. Further study topics could include a review of treatment rendered as well as 28-day mortality. While considering the limited population size and diversity the data does seem to encourage the use of the shock index in patients presenting with possible infection. This tool could be a rapid, low cost addition to a current sepsis screening process which is being completed in the ED triage area. Of note, for the 61 patients reviewed only 4 patients (6.6%) did not have a sepsis screen documented as part of the triage process. The sepsis screen is widely utilized by the ED Staff and could easily have a component for the shock index added to increase potential awareness of early sepsis notifications.



Limitations

- This study was limited by the low volume of patients noted to be in the sepsis registry.
- The study also was limited by only reviewing patients with documented Sepsis as per the Nuance Registry.
- Future potential areas of review could include the 28 day mortality of the patient and including non-sepsis patients that receive the sepsis screening in the ED.

References

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