

Evaluation of Antimicrobial Utilization in Early Empiric Protocol-Guided Management of Sepsis: A Single-center Experience

Newark Beth Israel Medical Center
Children's Hospital of New Jersey
Barnabas Health

Michael Corbett, M.D., Elisha Bishburg, M.D.
Division of Infectious Disease, Newark Beth Israel Medical Center, Newark, NJ

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Background

- The Surviving Sepsis Campaign (SSC) Early Resuscitation Bundle recommends prompt administration of empiric broad-spectrum antimicrobial therapy with activity against "all likely pathogens"¹.

Objectives

- To determine antibiotic (ABX) utilization in the first 48 hours of admission in protocol-guided sepsis patients and analyze for correlates to ABX utilization.

Methods

- Prospective, observational cohort analysis of all patients identified for utilization of early sepsis intervention treatment bundle.
- This study was done in a 670-bed tertiary care teaching hospital between November 2012 and December 2013.
- Data was collected for patient demographic, APACHE score, patients preadmission location. Hospital and ICU length of stay, source of infection BMI, WBC count and lactate levels on admission. Number of ABX used in the first 48 hours, change in ABX utilization, total ABX days, and microbiological data.
- All data were obtained from hospital database and chart review. SAS software was utilized to perform analyses by Chi-square, Wilcoxon Rank Sums, *t*-test, and Fischer's exact test statistics.

Results

Figure 1. Patient Pre-Hospital Origin (%)

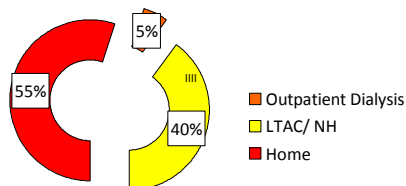


Figure 2. Infection Source (%)

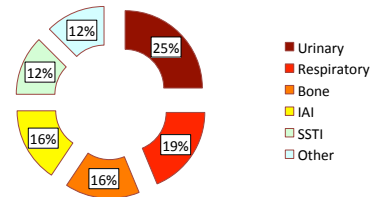


Figure 3. Comparison of Clinical Correlates in Patients Administered <4 vs. >=4 Different ABX in the first 48 hours of Admission

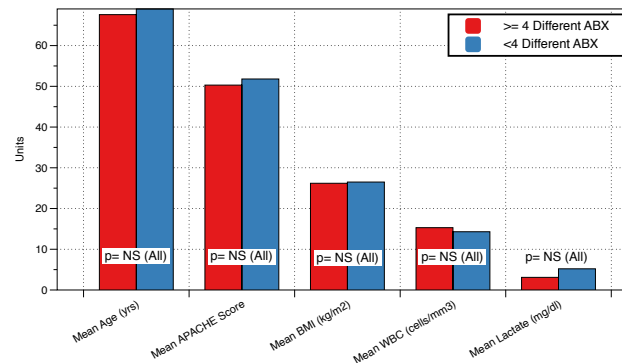
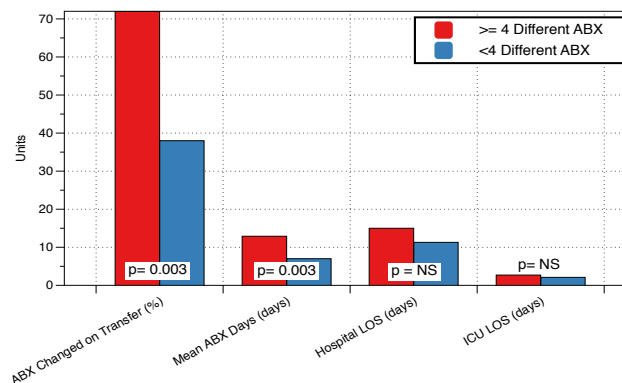


Figure 4. Comparison of Clinical Management and Disposition Dynamic Correlates in Patients Administered <4 vs. >=4 Different ABX within the first 48 hours of Admission



Results

- Forty patients were identified and included in the study.
- There were 47% male (19/40), 55% (22/40) originated from home, 40% (16/40) from a nursing home, and 5% (2/40) from an outpatient dialysis center.
- There were 35% (14/40) who received >= 4 ABX compared to 65% (26/40) receiving < 4 ABX, in the first 48 hours of admission.
- Mean ABX days was significantly shorter (7 days) in those receiving < 4 ABX compared to (12.4 days) in those receiving >= 4 ABX (p=0.003).
- Patients leaving the ER had their ABX regimen in 72% (29/40) vs. 28% (11/40) (p=0.003).
- Documented source of infection was found in 80% (32/40): urinary 8 (20%), respiratory 6 (15%), skin/soft tissue 4 (10%), bone 5 (12.5%), intra-abdominal 5 (12.5%), and other 4 (10%).
- Age, APACHE score, hospital length of stay, ICU length of stay, BMI, WBC count and the presence of documented infection were not statistically correlated to ABX utilization.

Conclusion

- In our hospital, The ABX days significantly shorter in those receiving < 4 ABX compared to those receiving >= 4 ABX.
- A significant number of patients had their ABX changed upon leaving the ER.
- Additional antibiotic stewardship efforts should be targeted at early sepsis management.

References

- Dellinger RP, Levy MM, et al. Surviving Sepsis Campaign: international guidelines for management of severe sepsis and septic shock, 2012. *Intensive Care Med.* 2013 Feb;39(2): 165-228.