The Utility of Routine Admission Surveillance Cultures in Long-Term Acute Care Hospital Patients

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Abstract

Background: Long-term acute care hospital (LTACH) patients are at high risk for colonization with multidrug-resistant organisms (MDROs). However, there are limited data on the use of surveillance cultures in this setting. The objective of this study was to evaluate the utility of admission surveillance cultures in LTACH patients, including rates of positivity, and the rate of inappropriate treatment for asymptomatic bacteriuria. 

Methods: All patients admitted to a university LTACH from 2008 through 2014 were included. During this period, all patients had routine blood and urine cultures performed on admission. Monthly rates of positive cultures were calculated, including for MDROs. Medical record review using NHSN surveillance definitions were used to identify and determine treatment of ASB.

Results: Of 2,001 total admissions, there were 151 positive admission blood cultures (rate of 7.24 positive per 100 admissions) and 631 positive admission urine cultures (rate of 30.3 positive per 100 admissions). Rates of resistance were high, including 55% extended-spectrum beta-lactamase (ESBL) - positive Enterobacteriaceae, 92% methicillin-resistant Staphylococcus aureus (MRSA), 71% extended-spectrum cephalosporin-resistant (ESC) Pseudomonas aeruginosa, and 50% vancomycin-resistant Enterococcus (VRE). Nearly 20% of patients received antibiotic treatment for ASB.

Conclusion: Rates of positive blood and urine cultures on admission were high in LTACH patients, particularly with MDROs. Notably, while rates of coagulase-negative staphylococci were high, clinically significant organisms were also frequently identified on surveillance blood cultures in patients. In addition, the rate of inappropriate antibiotic treatment for ASB was high. Future studies should focus on interventions for timely identification of infections in this critically ill population and strategies to reduce unnecessary antibiotic use.

Background

- Long-term acute care hospital (LTACH) patients are at high risk for colonization with MDROs.
- However, practices regarding the utility of admission surveillance cultures, particularly on the rate of inappropriate treatment for asymptomatic bacteriuria, have not been well studied.

Objectives

- To identify rates of positive blood cultures and urine cultures performed as part of routine admission surveillance for all LTACH patients.
- To identify rates of surveillance blood and urine cultures that are positive for an MDRO.
- To identify the rate of inappropriate treatment with antibiotic therapy for patients with ASB on admission.

Methods

- Study design and population: Retrospective cohort study of patients admitted to a Philadelphia LTACH from July 2008 through November 2014.
- Blood and urine cultures performed within 24 hours of admission included.
- Medical chart review and application of National Healthcare Safety Network surveillance definitions for identification of urinary tract infection and asymptomatic bacteriuria.

Results

- Overview:
  - 2001 unique admissions
  - 7.24 positive blood cultures per 100 patient-admissions (SD 5.65)
  - 30.3 positive urine cultures per 100 patient-admissions (SD 14.4)
  - 369 patients had resistant blood cultures with resistance within the past year in the healthcare system.
  - Of blood cultures with resistant Enterococcus spp., Enterobacteriaceae, or Staphylococcus aureus, 10 of 39 (26%) had a prior positive culture with this organism within the past year in the healthcare system.

Conclusions

- Rates of positive blood and urine cultures sent on admission to an LTACH were high, as were rates of MDROs.
- Coagulase negative staphylococci was the most common organism in blood cultures, likely a contaminant in most cases, but clinically significant organisms were found often as well.
- Nearly a fifth of patients with asymptomatic bacteriuria received inappropriate antibiotics.