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Paper Poster Session
Focus Acinetobacter

Evaluation of carriage and environmental spread of carbapenem-resistant Acinetobacter baumannii

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Background: Carbapenem-resistant *Acinetobacter baumannii* (CRAB) is a rapidly emerging nosocomial pathogen. Early identification of carriers is important for infection control, but active surveillance is limited because test sensitivity is low and the optimal anatomic sites for sampling are uncertain. We evaluated the sensitivity of a novel technique to detect CRAB in patients and in their environment.

Material/methods: Patients with a clinical culture positive for CRAB were sampled within 7 days. Swabs were taken from the mouth (buccal mucosa) and rectum. Premoistened sterile sponges were used to collect cultures from the patient's skin and surrounding environment. Specimens were inoculated onto CHROMagar MDR *Acinetobacter* plates both directly and after overnight incubation in BHI broth for enrichment. MALDI-TOF was used for *A. baumannii* identification. CRAB load was scored semi-quantitatively and composite scores for patient colonization and environmental contamination were calculated.

Results: Thirty-four patients were included. Sources of clinical cultures were sputum in 24 patients, urine (12), wounds (7), drains (5), and blood (4). Screening sensitivity for the 3 sites together was 94%; sensitivity of individual sites was 82% for mouth, 88% for skin, and 74% for rectum. Among patients with CRAB isolated from sputum, sensitivity for the 3 sites together was 100%. Among patients with CRAB isolated from sites other than sputum, sensitivity was 80%. Antibiotic treatment did not significantly affect the sensitivity of screening for the 3 sites together: sensitivity was 92% in patients who received no antibiotics, 96% after an antibiotic not active against CRAB, and 90% after an antibiotic active against CRAB. Sensitivity for all 3 sites using direct plating was 89%. Direct plating alone was more sensitive (100%) among patients with CRAB isolated in sputum than among patients with CRAB isolated elsewhere (sensitivity 63%). At least one surface in the environment of all patients was positive for CRAB. The sites closest to the patient had the highest yields: CRAB was recovered from 88% of bedrails and 91% of bed sheets. There was a positive correlation between the patient colonization score and the environmental contamination score ($r=0.63$, $p<0.001$).

Conclusions: Our methods were highly sensitive for detecting CRAB, especially in patients with CRAB isolated in sputum. We attribute the higher detection rates in our study as compared to previous studies to the combination of improved sampling technique and the use of CHROMagar plates. Our study has important implications for infection control: the high sensitivity and rapid turnaround time afforded by direct plating allows timely identification and isolation of CRAB carriers in an outbreak setting as well detecting environmental sources of contamination. Screening results could also be used to guide empiric antibiotic treatment for patients with symptoms of infection.