Burden and Trends of Hospital-Associated Community-Onset (HACO) Infections From Antibiotic Resistant and Nonresistant Bacteria

Babatunde Oluobao, Centers for Disease Control and Prevention; Sujan Wolfor, Centers for Disease Control and Prevention; Hannah Hatfield, Centers for Disease Control and Prevention; John Jernigan, Centers for Disease Control and Prevention; James Baggs, Centers for Disease Control and Prevention

Background: Studies on the effectiveness of hospital-based interventions often measure hospital-onset infections as the outcome of interest. However, hospital-associated infections may manifest after patient discharge (classified as hospital-associated community-onset, HACO), and the epidemiology may vary by antibiotic resistance (AR) profile. We examined the epidemiology and trends of HACO infections of AR and non–antibiotic-resistant (non-AR) bacteria.

Methods: We included clinical community-onset (CO) cultures (obtained sooner than or on day 3 of hospitalization) yielding the bacterial species of interest among hospitalized patients in 260 hospitals in the Premier Healthcare Database from 2012 to 2017. HACO infections were defined as CO cultures in a patient who had a previous hospitalization in the same hospital within 30 days. We examined methicillin resistance among Staphylococcus aureus (MRSA), vancomycin resistance among Enterococcus spp (VRE), carbapenem resistance among Enterobacteriaceae (E. coli, Klebsiella spp, and Enterobacter spp) (CRE), extended-spectrum cephalosporin resistance suggestive of extended-spectrum β-lactamase (ESBL) production in Enterobacteriaceae, carbapenem resistance among Acinetobacter spp (CRAsp), and carbapenem resistance among Pseudomonas aeruginosa (CRPA). We described the proportion of CO infections that were HACO, the proportion of HACO infections from sterile sites, overall HACO rates, and annual trends for sensitive and resistant phenotypes. Generalized estimating equation regression models that accounted for hospital-level clustering were used to estimate annual trends controlling for hospital characteristics and month of discharge. Results: The rate of HACO infections by pathogen ranged from 0.78 to 38.76 per 10,000 hospitalizations; 7%–34% were sterile site infections (Table 1). For each bacterial pathogen, a significantly higher proportion of AR CO infections had a previous hospitalization compared to non-AR CO infections (all χ², P < .05). The annual trends for AR and non-AR HACO infections between 2012 and 2017 were significantly decreasing for most pathogens, except ESBL HACO infections.

Conclusions: Even when using a definition limited to readmission to the same hospital, HACO infections occur commonly with differing rates by pathogen and antibiotic resistance profile. Although these rates are decreasing for most of the pathogens studied, improving surveillance and identifying prevention strategies for these infections are necessary to further reduce the burden of hospital-associated infections.

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