475. Burden of Clostridium difficile Infection in South Carolina: A Population-Based Study

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Background. Clostridium difficile infection (CDI) is a major cause of morbidity and mortality in the United States. The aims of this cross-sectional population-based study are to determine overall Incidence rate of CDI in the State of South Carolina and estimate the healthcare and financial burden of community-associated C. difficile infection (CA-CDI).

Methods. South Carolina CDI initiative identified CDI cases from National Healthcare Safety Network (NHSN), and the South Carolina Infectious Disease and Outbreak Network (SCION) from January 1, 2015 to June 30, 2016 through complete enumeration of the state’s population, excluding infants <1 year old. A positive stool C. difficile test was regarded as a “CDI case” for purposes of this study. Only first and recurrent episodes after 8 weeks of initial one were included in this analysis.

Results. During the 18-month study period, 10,254 unique CDI events were identified in South Carolina residents 21 year old. Over one-half of CDI cases were CA-CDI (5192; 51%), 2678 (26%) were community-onset healthcare facility associated (CO-HCFA), and 2384 (23%) were hospital-onset (HO) cases. Overall incidence rate of CA-CDI in South Carolina per 100,000 person-years was 141 (71, 37, and 33 for CA-CDI, CO-HCFA, and HO-CDI, respectively). Among 5,192 episodes of CA-CDI, 2,127 (41%) required hospitalization with a median length of stay of 5 days and median cost of $31,270. Additionally, 574 (11%) of CA-CDI cases were treated in emergency rooms without admission to the hospital. The annual burden of CA-CDI on the South Carolina healthcare system was estimated at 387 ambulatory emergency room visits and 9,282 hospital days. The estimated annual hospital charges for patients with CA-CDI in South Carolina were $68,491,046.

Conclusion. The incidence rate of CA-CDI in South Carolina has surpassed both CO-HCFA CDI and HO-CDI combined. The heavy burden of CA-CDI justifies dedicated healthcare surveillance and control initiatives targeting unnecessary and inappropriate antimicrobial use in the community may reduce the burden of CDI in South Carolina.

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477. Trends in the Incidence of Community-Associated and Healthcare-Associated Clostridium difficile Infections in Quebec Over a 7-Year Period (2008–2015)

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Background. Clostridium difficile infections (CDI) affect hospitalized patients but also individuals in the community. The epidemiology of healthcare-associated (HA) CDI has received much scrutiny, but little is known regarding trends in the incidence rate of community-associated (CA) cases. We describe and compare long-term trends in the incidence rate of community- and healthcare-associated C. difficile infection (CA-CDI and HA-CDI).

Methods. Hospitalized patients with CA-CDI and HA-CDI were identified prospectively between April 2008 and April 2015 through the Quebec CDI surveillance program (QCISP), a network of 95 acute-care institutions using standardized case definitions. Hospitalized CA-CDI cases were defined as C. difficile per 100,000 inhabitants; 3 days of admission or >4 weeks before any inpatient or outpatient care. CA-CDI cases were defined as HA-CDI if they occurred >3 days after admission and up to 4 weeks following discharge. Trends in the incidence of CA-CDI and HA-CDI were compared using time series models with segmented regression and Poisson law.

Results. Between 2008 and 2015, 28,850 CDI were detected in hospitalized patients. Of these, 4,481 (15.5%) were CA and 24,369 (84.5%) HA-CDI. The annual CA-CDI incidence rate increased by 35.2% from 0.51 to 0.68 per 100,000 population (P = 0.001; OR = 2.00; 95% CI: 1.65, 2.42), with the rise of PCR that may help guide clinical testing and initial treatment, especially in healthy adults. The annual burden of CA-CDI in South Carolina per 100,000 person-years was 141 (71, 37, and 33 for CA-CDI, CO-HCFA, and HO-CDI, respectively). Among 5,192 episodes of CA-CDI, 2,127 (41%) required hospitalization with a median length of stay of 5 days and median cost of $31,270. Additionally, 574 (11%) of CA-CDI cases were treated in emergency rooms without admission to the hospital. The annual burden of CA-CDI on the South Carolina healthcare system was estimated at 387 ambulatory emergency room visits and 9,282 hospital days. The estimated annual hospital charges for patients with CA-CDI in South Carolina were $68,491,046.

Conclusion. The incidence rate of CA-CDI in South Carolina has surpassed both CO-HCFA CDI and HO-CDI combined. The heavy burden of CA-CDI justifies dedicated healthcare surveillance and control initiatives targeting unnecessary and inappropriate antimicrobial use in the community may reduce the burden of CDI in South Carolina.

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Conclusion. From 2011 to 2016, the CDI incidence and mortality decreased concurrently with a decrease in the percentage of infections due to the NAP1/027 strain. Although NAP1/027 is known to be associated with more severe outcomes, we did not observe a reduction in the proportion of cases that died or the proportion of cases that were hospitalized.

Figure 1. Incidence and Mortality Rates of CDI.

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480. Reduction in Clostridium difficile Infection Rates Following a Prevention Collaborative in Orange County, California, 2014–2017
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Background. The California Department of Public Health (CDPH) Healthcare-Associated Infections (HAI) Program and Orange County Health Care Agency convened a Clostridium difficile infection (CDI) prevention collaborative with health care facilities in Orange County (OC) to reduce CDI incidence in the region.

Methods. We invited all 34 hospitals and 76 skilled nursing facilities (SNF) in OC to participate from June 2015 to June 2016. Participants received onsite infection control and antimicrobial stewardship assessments, trainings, and an interfacility transfer communication improvement initiative. We used an interrupted time-series design and segmented regression analysis to evaluate monthly hospital-onset (HO) and community-onset (CO) CDI rates for acute care hospitals (ACH) reporting HAI data to CDPH via the National Healthcare Safety Network. The baseline period included 17 months (January 2014–June 2015) and the collaborative period 28 months (September 2015–December 2017). All OC acute care hospitals were included in the CO-CIDI model to account for direct and indirect effects of the collaborative. We included only participating ACH in the HO-CIDI model. For informal comparisons, we assessed changes in CO-CIDI for ACH in three San Francisco Bay Area counties and HO-CIDI rates in nonparticipant OC acute care hospitals.

Results. Collaborative participants comprised 15 ACH, three long-term acute care hospitals, one children’s hospital, and 20 SNF; all but two SNF received an onsite assessment. Unadjusted, baseline pooled mean HO-CIDI rates were 9.5 cases per 10,000 patient days for participant ACH, and CO-CIDI rates were 4.9 cases per 1,000 admissions in OC acute care hospitals. During the collaborative period, HO-CIDI rates in OC participant ACH decreased 2% per month (incidence rate ratio [IRR]: 0.98, 95% CI: 0.96, 0.99; P < 0.001); HO-CIDI rates among OC nonparticipant ACH (N = 10) did not change compared to the same timeframe (IRR: 0.99, 0.96, 1.02; P = 0.37). During the collaborative period, Orange County CO-CIDI rates also declined 2% per month (IRR: 0.98, 0.97, 0.99; P < 0.001); no changes in CO-CIDI were observed among ACH (N = 27) in the comparison counties (IRR: 1.00, 0.99, 1.01; P = 0.78).

Conclusion. Our analysis of acute care hospitals in Orange County provides evidence that coordinated, regional multifacility initiatives can reduce CDI incidence.

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