

Denver County *Clostridium difficile* Trends and Associated Risk Factors 2011-2013

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Objective

Identify population-based *Clostridium difficile* infection (CDI) incidence stratified by Health Care Facility Onset (HCFO), Community Onset-Healthcare Facility Associated (CO-HCFA), and Community Onset-Community Associated (CO-CA) CDI in Denver County from 2011 - 2013 and describe demographic, health care facility exposure, and medication use risk factors.

Introduction

Clostridium difficile (CD), a gram-negative, anaerobic, spore-forming bacterium causes symptoms ranging from mild to severe diarrhea and may result in death.¹ Approximately 75% of CDI cases have symptom onset outside of health care settings.² Annual US costs of treatment and infection containment have surpassed \$4.8 billion.³ Risk factors for CDI include recent broad-spectrum antibiotic exposure, advanced age, severe underlying morbidities, immunocompromised status, long-term hospital stays, and residence in long-term-care facilities.⁴ Nationally, CO-CA cases have increased from 2.8/100,000 person in 1993 to 14.9/100,000 person in 2005.⁵

Methods

A retrospective chart review studied CDI cases from 2011 through 2013 with incident (no positive test in the previous 8 weeks) stool specimen (CDI positive toxin or molecular assay) reported to the state health department, among Denver County residents older than 1 year. Cases were randomly selected for chart review. Cases were stratified by epidemiologic classification (HCFO, CO-HCFA or CO-CA) and analyzed for associations with: age, gender, antibiotic exposure, underlying disease, and exposure to high risk areas (e.g., long-term care facilities and hospitals). Rates were calculated using State Demography Office-Department of Local Affairs information. Descriptive statistics (means and frequencies) were used to describe CDI trends by year, demographic group, epidemiologic classification, and risk factors.

Results

Between 2011 and 2013, 2503 CDI cases were reported and 892 cases were chart reviewed (22%) and identified as CO-CA (339), CO-HCFA (175), or HCFO (44). Denver CDI incidence rate increased from 129/100,000 residents in 2010 to 139/100,000 residents in 2013. Incidence rates of cases classified as HCFO and CO-HCFA remained stable over the study period. Rates of CO-CA cases decreased from 50.4/100,000 residents in 2011 to 46/100,000 residents in 2013. The mean age for HCFO cases was 67 years, 49 years for CO-CA cases, and 56 years for CO-HCFA cases. HCFO was more common among men; there were no gender disparities for CO-CA or CO-HCFA. During the study period, the presence of underlying morbidities increased in all onset types with over half of CO-CA and CO-HCFA cases reporting underlying morbidities in 2013 (CO-CA: 65%; CO-HCFA: 69%). Antibiotic exposure substantially increased between 2011 and 2013, in cases classified as CO-HCFA (29% to 70%), and CO-CA (18% to 50%).

Conclusions

Rates of CO-CA CDI rose during the study period. Our study reflects national trends in age and antibiotic exposure by epidemiologic classification.⁶ The frequency of antibiotic exposure and underlying morbidities increased from 2011 to 2013 in both CO-CA and CO-HCFA cases. Denver CO-CA cases had more underlying morbidities compared to recent reports.⁷

Keywords

Clostridium difficile; healthcare associated infections; community acquired infections; Infectious disease

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