**1659. Relapse vs Reinfection. Evaluation of *Clostridium difficile* Isolates from Incident and Recurrent Infections, Minnesota 2009-2011**

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***Background.*** Recurrent *Clostridium difficile* infections (CDI) can be challenging. Recent studies suggest patients with recurrent infections are more likely to have a relapse of their previous strain type than be infected with a new strain of *C. difficile*, particularly those patients infected with the NAP1 strain. We used PFGE to type and compare 2009-2011 incident and recurrent isolates collected in Minnesota.

***Methods.*** We analyzed data from clinical laboratories in 4 Minnesota counties participating in active population-based CDI surveillance as part of the CDC Emerging Infections Program. An incident case was defined as a *C. difficile* positive stool by either toxin or molecular assay in a surveillance area resident at least 1 year of age without a positive test in the prior 8 weeks. A recurrent case was defined as an additional positive stool collected >2 weeks but <6 months following an incident infection. Pairs of incident and recurrent isolates underwent PFGE and assigned a NAP type based on the PFGE pattern. Isolates were classified as indistinguishable if 0 PFGE bands different, related if = 6 bands and unrelated if > 6 bands.

***Results.*** Of 581 patients with *C. difficile* isolates, 118 (20%) patients had incident and recurrent infections and isolates available for analysis. Fifty-four percent of patients had 1 recurrence (range: 1-5). Among first recurrent isolates, 72% were indistinguishable, 14% were related, and 15% were unrelated when compared to the incident isolate. The median time between the two episodes was 41 days (range: 15-170 days). Increases in time to recurrence were correlated with increases in PFGE pattern band differences ($r = 0.39$, $n = 116$, $p < 0.0001$). Most recurrences (82%) occurred within 8 weeks of the incident specimen. Patients with incident NAP1 infections were not more likely to have recurrences (15% vs 12%; $p = 0.5$), nor more likely to relapse on first recurrence (94% vs 82%; $p = 0.1$) than patients with non-NAP1 infections.

***Conclusion.*** The majority of patients with recurrent CDI had a relapse of their initial strain type. Patients with NAP1 infections were not at higher risk for recurrence or relapse. Evaluation of CDI treatment and minimizing risk factors for recurrence are warranted to ensure patients are able to control the initial infection.

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