P0774
Poster Session III
Clostridium difficile: epidemiology and outcomes

NON-TOXIGENIC CLOSTRIDIUM DIFFICILE COLONISATION AND RISK OF SUBSEQUENT C. DIFFICILE INFECTION

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Objectives: Non-toxigenic *Clostridium difficile* (NTCD) isolates have garnered attention for their capacity to colonise humans and potentially reduce the risk of *C. difficile* infection (CDI). There are studies that have investigated the protective effect of NTCD in hamsters and swine, but the evidence in human subjects is more limited. The current study was undertaken to evaluate whether patients colonised with NTCD exhibited an altered risk of subsequent CDI.

Methods: A longitudinal study was conducted within the University of Michigan Health System, a large tertiary referral center. Participants were individuals who submitted stool samples for testing of *C. difficile* from October 2010 to March 2012. Preliminary results from 301 patients (positive samples and a random subset of negative samples) were analysed for purposes of this report. Patients were observed from 2 weeks subsequent to the initial date of stool collection to 365 days post-collection date. The primary outcome was time to toxigenic CDI. Survival analyses were conducted with Kaplan-Meier curves and Cox proportional hazards regression, yielding hazard ratios (HR) adjusted for baseline patient characteristics.

Results: At baseline, 66 patients were colonised by NTCD, 151 patients had toxigenic *C. difficile*, and 84 patients were not colonised by *C. difficile*. The mean age of patients was 57.4 years (SD, 1.4). During the course of the 365 day follow-up period, a total of 64 individuals (21.3%) developed CDI in the entire cohort. In the group of patients who did not have *C. difficile* at baseline, 8 (9.5%) developed CDI during this time period. There were 10 patients (15.2%) with NTCD at baseline who developed CDI and there were 46 patients (30.5%) with toxigenic *C. difficile* at baseline who developed recurrent CDI (p<0.001). Kaplan-Meier survival curves were generated by baseline status (Figure). Results from the Cox proportional hazards regression models indicated that patients with NTCD colonisation were 54% less likely to develop CDI than patients with toxigenic *C. difficile* at baseline (adjusted HR=0.46; 95% CI 0.23-0.95;p=0.036). There was no significant difference in risk of CDI between patients with no *C. difficile* and patients with NTCD (HR=1.58; 95% CI 0.62-4.00;p=0.339). Patients with toxigenic *C. difficile* at baseline were 3.41 times more likely to develop CDI over the course of the year as those patients without *C. difficile* (HR=3.41; 95% CI 1.56-7.45;p=0.002).

Conclusion: Results of this study suggest that patients colonised by NTCD may be less likely to develop toxigenic CDI compared to those patients with toxigenic *C. difficile*. Rates of developing CDI were similar in individuals with NTCD and those without *C. difficile* colonisation.

Figure: Kaplan Meier Curves indicating Proportions of Patients without *Clostridium difficile* Infection by Baseline Colonisation Status