

O015

Oral Session

Improving antibiotic prescriptions quality

EFFECT OF ANTIBIOTIC STEWARDSHIP PROGRAMS ON CLOSTRIDIUM DIFFICILE INCIDENCE: A META-ANALYSIS

L.M. Feazel¹, A. Malhotra², E.N. Perencevich³, P. Kaboli³, D.J. Diekema³, **M.L. Schweizer³**

¹Carver College of Medicine, University of Iowa, Iowa City IA, USA ; ²Center for Comprehensive Access and Delivery Research and Evaluation, Iowa City VA Health Care System, Iowa City IA, USA ; ³Internal Medicine, University of Iowa, Iowa City IA, USA

Objectives: Antibiotic exposure nearly always predates *Clostridium difficile* infections. Broad-spectrum antibiotics have been particularly implicated, including 3rd generation cephalosporins, fluoroquinolones, and clindamycin. Restriction of exposure to certain 'high-risk' antibiotics through antibiotic stewardship programs is a potential method of preventing *C. difficile* infections. Our objective was to perform a meta-analysis of published studies to assess the effect of antibiotic stewardship programs on the risk of *C. difficile* infection in hospitalized adult patients.

Methods: Searches of PubMed, Web of Science, CINAHL, and the Cochrane databases were conducted to find all published studies on interventions related to antibiotic stewardship and *C. difficile*. This meta-analysis was conducted according to the Meta-analysis Of Observational Studies in Epidemiology (MOOSE) checklist. Two investigators independently assessed study eligibility and extracted data. Exclusion criteria were: non-hospital settings, pediatric populations, outbreak situations, lack of primary data, failure to report changes in *C. difficile* rates, failure to report risk ratios, insufficient data for a contingency table, or were written in a language other than English. Risk of bias was assessed using the Downs and Black tool. Antibiotic stewardship programs were classified as either persuasive (e.g. education, post-prescription review and recommendations, and changes in guidelines) or restrictive (e.g. complete removal of drug or prior approval requirement). Risk ratios (RR) were pooled using random-effects models. Heterogeneity was evaluated using the Cochran Q and the *I*² statistics. Publication bias was assessed by visual inspection of a funnel plot.

Results: The systematic literature search yielded 891 articles, of which 814 were excluded based on the title and abstract. 77 full articles were reviewed, and 15 total articles were identified for inclusion. Inspection of the funnel plot indicated no publication bias. When results of all studies were pooled in a random effects model, a significant protective effect (pooled RR: 0.49; 95% confidence interval [CI]: 0.39, 0.63) was observed between antibiotic stewardship programs and *C. difficile* incidence. Both studies with lower (pooled RR: 0.49; 95% CI: 0.43, 0.55; n=9; *I*²=0%) and higher (pooled RR: 0.52; 95% CI: 0.33, 0.81; n=6; *I*²=85%) risk of bias showed a significantly protective benefit of antibiotics stewardship programs. When stratified by intervention type, a significant protective effect was found for restrictive antibiotic stewardship programs (pooled RR: 0.48; 95% CI: 0.40, 0.58, n=7; *I*²=31%). Conversely, persuasive antibiotic stewardship programs were not associated with a statistically significant protective effect (pooled RR: 0.59; 95% CI: 0.31, 1.12, n=4; *I*²=25%). Furthermore, antibiotic stewardship programs were particularly effective in geriatric settings (pooled RR: 0.44; 95% CI: 0.35, 0.56; n=6; *I*²= 1%).

Conclusion: Antibiotic stewardship programs are effective at reducing *C. difficile* incidence, especially in geriatric settings. Restrictive antibiotic stewardship programs may be more effective than persuasive programs to reduce the risk of *C. difficile* infection.