P0785
Poster Session III
Clostridium difficile: epidemiology and outcomes

STORAGE DURATION OF RED BLOOD CELL TRANSFUSION AND CLOSTRIDIUM DIFFICILE INFECTION: A WITHIN-PERSON COMPARISON

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Objectives: We previously reported an association between red blood cell (RBC) transfusion and *Clostridium difficile* infection (CDI) in patients undergoing coronary artery bypass graft surgery. Two other studies found similar results, including a large prospective study at 10 centers. Since adverse effects have been noted with prolonged storage of RBC units, we planned an investigation to examine this further with a more robust within-person study design.

Methods: A within-person case-crossover study was conducted. All inpatients with healthcare-associated CDI were identified from 01/07/2009 through 30/06/2012 within the University of Michigan Health System (n=406). For each index hospitalization with CDI, subsequent hospitalizations for the same patient in which no *C. difficile* was isolated served as the comparator hospitalizations (n=949). Events that occurred prior to the positive stool assay for *C. difficile* during the index hospitalization were compared to events that occurred during the hospitalizations in which CDI did not occur (comparator hospitalizations). Data were extracted from the electronic medical record regarding patient characteristics, procedures, and medications. Detailed information was available regarding dates and timing of administration of medications and blood products. Red cell components were leukocyte reduced through prestorage filtration. To account for the within-person matching, a conditional logit model was used to generate odds ratios (OR) and 95% confidence intervals (CI) for the association between exposures and CDI, offset by the natural log of the time at risk.

Results: During the hospitalizations when CDI occurred, 34.7% of the patients received allogeneic RBC transfusions (mean volume, 688 ml) compared to 19.0% of patients in hospitalizations without CDI (mean volume, 180 ml). The odds of healthcare-associated CDI increased by 76% (95% CI 1.39-2.23) for every liter of RBCs transfused after adjustment for surgical procedures, chemotherapy, dialysis, and the number of doses of antibacterial, immunosuppressant, proton pump inhibitor, histamone-2 receptor antagonist, and statin medications. The adjusted odds ratio for the association between RBC transfusion and CDI was elevated in both nonsurgical (OR=1.90) and surgical (OR=1.86) hospitalizations. Duration of storage ranged from 2 to 42 days, with a mean of 25 days and a median of 26 days. In patients who received RBC transfusions, the odds of developing CDI increased by 5% (95% CI 1%-9%) for every additional day of RBC stored and by 40% (6%-85%) for every week of additional storage (P=0.019) with adjustment for RBC volume, medications, and procedures.

Conclusion: Hospitalizations in which a patient received a greater volume of RBC transfusions were more likely to be associated with the development of CDI. RBC units stored for a longer duration were associated with the development of healthcare-associated CDI after adjustment for RBC volume.