

## **GASTROINTESTINAL PERFORATIONS: EXAMINING THE OVERLOOKED UNINTENTIONAL CONSEQUENCES OF OUR NATION'S EPIDEMIC OF ANTIBIOTIC EXPOSURE**

Vijaya T. Daniel MD, MPH<sup>1,2</sup>, Stacy B. Sanders MD, MS, MHA<sup>1,2</sup>, Didem Ayturk MS<sup>2</sup>, Beth A. McCormick PhD<sup>3</sup>, Heena P. Santry MD, MS<sup>2,4</sup>

<sup>1</sup>Surgical Research Scholars, Department of Surgery, <sup>2</sup>Department of Surgery, <sup>3</sup>Center for Microbiome Research, <sup>4</sup>Department of Quantitative Health Sciences, University of Massachusetts Medical School

**Objective:** More than 266 million courses of antibiotics are dispensed to outpatients annually in the US, with the rising elderly population consuming a substantial number of antibiotics. At least 30% of these antibiotics prescribed are unnecessary. Alterations in gut microbiome are known to cause stomach and small intestine (SSI) perforations. However, the impact of antibiotic exposure outcomes of SSI perforations among the elderly has not been studied. We examined the relationship between antibiotic exposure, as a proxy for microbiome modulation, and SSI perforation outcomes in a nationwide sample of elderly patients.

**Methods:** A 5% random sample of Medicare beneficiaries (2009-2011) was queried to identify patients with SSI perforations. Previous outpatient antibiotic exposure (0-30, 31-60, 61-90 days prior to admission) was assessed. Clinical characteristics were compared between no previous antibiotic exposure (NPA) and previous antibiotic exposure (PA) patients. Primary outcome was in-hospital mortality. Secondary outcomes included length of stay and 30-day readmission. Univariate and multivariable regression analyses were performed.

**Results:** Overall, 401 patients  $\geq 65$  years had SSI perforations (68.3% with NPA and 31.7 % with PA). Mean age ( $\pm$  SD) was 80 years ( $\pm 8$ ). Overall in-hospital mortality was 13%. There was a significant difference in the rates of mortality (12% in NPA vs. 18 % in 0-30 days PA, 17% 31-60 days PA, and 8% 61-90 days PA,  $P = 0.002$ ). After adjustment of other factors, a trend toward increased in-hospital mortality was observed among patients in 0-30 days PA (odds ratio [OR] 2.0, 95% confidence interval [CI] (0.9, 4.7) and was significantly associated with ICU admission (OR 4.3, 95% CI (1.8, 10.2).

**Conclusion:** Recent antibiotic use increases illness severity and may increase mortality among elderly patients with SSI perforations. Exposure to antibiotics, one of the most modifiable determinants of microbiota, should be minimized in the outpatient setting.

### **Contact:**

Vijaya T. Daniel, MD, MPH

UMass Memorial Medical Center

[Vijaya.Daniel@umassmemorial.org](mailto:Vijaya.Daniel@umassmemorial.org)