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THE URINARY MICROBIOME IN WOMEN WITH MIXED URINARY INCONTINENCE

Hypothesis / aims of study
This is the first study to characterize the urinary microbiome in women with Mixed Urinary Incontinence (MUI) compared to asymptomatic age-matched Controls.

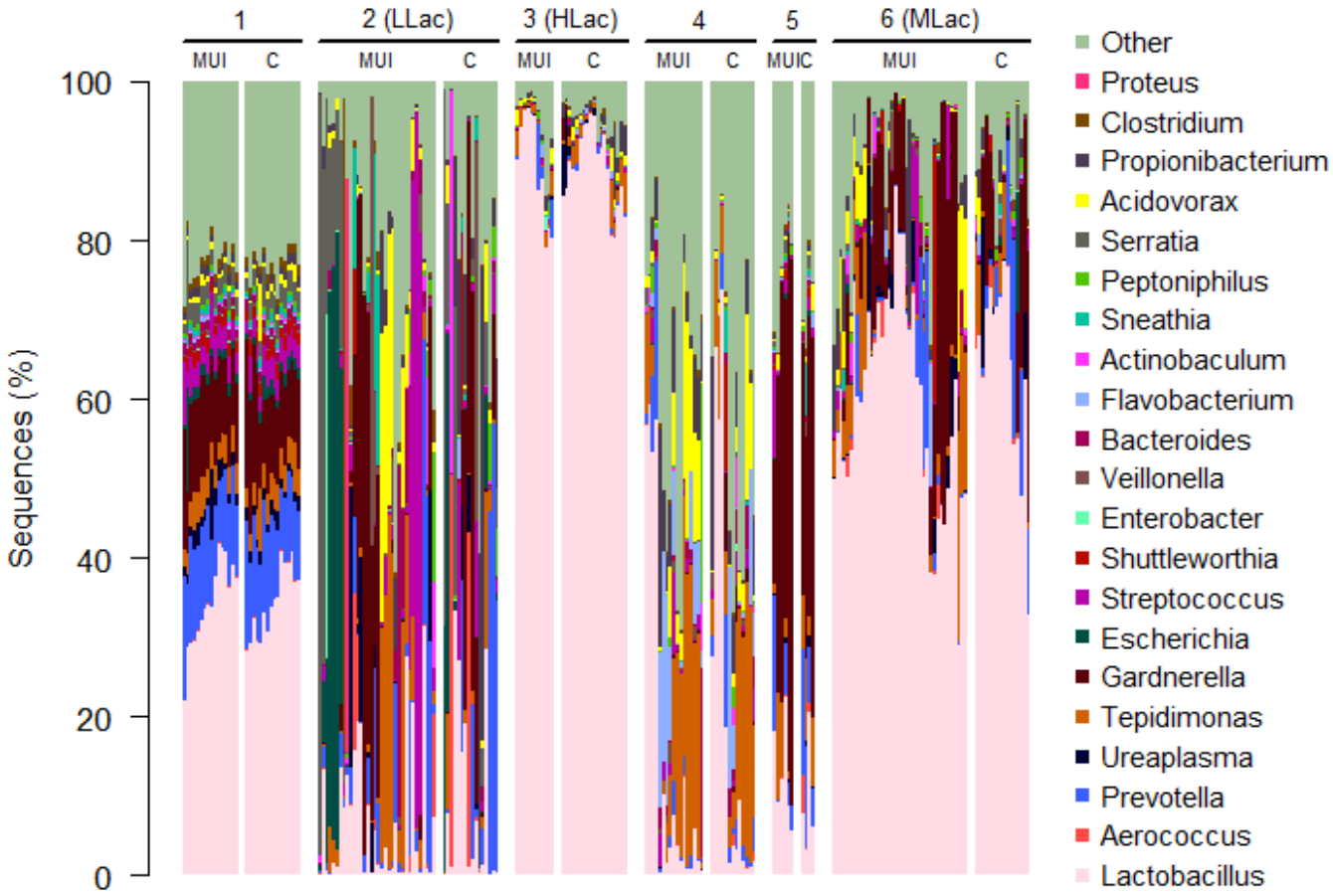
Study design, materials and methods
This case-control study recruited MUI participants from a parent study conducted at 8 US sites who had ≥ moderate bother on the Urinary Distress Inventory for both stress UI (SUI) and urgency UI (UUI). Controls had no urinary symptoms. Two hundred and ten women (126 MUI/84 Controls) were required to distinguish MUI and Control urinary microbiomes. DNA was extracted from catheterized urine, regions v4-6 of the 16S ribosomal RNA gene were amplified by polymerase chain reaction and sequenced. Urinary taxa were evaluated at the genus level and categorized into groups using Dirichlet multinomial mixture (DMM) methods. Univariate and multivariable analyses identified differences between MUI and Control groups. Significance was set at P<.05.

Results
Mean age of the 210 subjects was 53±11 years. MUI compared to Controls had a greater Body Mass Index (BMI) (32.7±7.1, 28.4±6.6 Kg/m^2, P<.001) and were more commonly Hispanic (23.6%, 7.1%, P=.008). DMM identified 6 groups with significant differences in proportion of taxa between groups (P=.032); these differed by age (P=.001) and smoking history (P<.001). On DMM analysis, a *High-Lactobacillus (HLac)* group (≥80% Lactobacillus) had the largest proportion of Controls (Controls 63.3%, MUI 36.7%). This group (see Figure, Group 3) served as the Control comparator for multivariable analyses, where BMI (aOR 1.09, CI 1.04-1.15) and specific DMM groups were independently associated with MUI. Compared to the *HLac* group, a *Moderate-Lactobacillus (MLac)* (see Figure, Group 6) and *Low-Lactobacillus(LLac)* (see Figure, Group 2) were more strongly associated with MUI; aOR 3.51 (CI 1.29-9.5) and aOR 2.92 (CI 1.03-8.31). Due to DMM group differences in age, separate multivariable analyses were performed for age <51 and ≥51 years. In women <51 years, BMI (aOR 1.10, CI 1.02-1.18) and specific DMM groups were again independently associated with MUI. In women <51 years, compared to the *HLac* group, the *MLac* (see Figure, Group 6) and *LLac* (see Figure, Group 2) were associated with MUI, aOR 8.54, CI 1.90-38.38 and aOR 7.59, CI 1.33-43.44. In women ≥51years, BMI (aOR 1.11, CI 1.03-1.21) and Hispanic ethnicity (aOR 5.54, CI 1.05-29.34) were independently associated with MUI but DMM groups were not.

Interpretation of results
The urinary microbiome of women with MUI differed from Controls. Bacterial groups with lower prevalence of *Lactobacillus* were found in women <51 years old with MUI. This difference was not found in older women where BMI and Hispanic ethnicity were independently associated with MUI.

Concluding message
The microbiome in women with MUI differentially impacts younger women. Future work may further characterize age-dependent differences in the MUI microbiome.

Dirichlet Multinomial Mixture (DMM) Microbiota Groups 1-6



Columns: Group Number/Labels. MUI, C=Controls
Bacterial Genus: Color-coded on right

Disclosures
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