EXAMINING CHANGES IN THE URINARY MICROBIOME INDUCED BY TRANSRECTAL ULTRASOUND GUIDED BIOPSY OF THE PROSTATE USING 16S RNA ANALYSIS

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BACKGROUND

Our understanding of the microbial environment of the prostate continues to be limited. New evidence indicates that the human urinary tract contains microbial communities; however, the role of these communities in urinary health has not been elucidated.

STUDY OBJECTIVES

To prospectively examine the changes in microbiota within the urinary tract after transrectal prostate biopsy.

STUDY METHODS

- Data, urine and fecal samples prospectively collected from 30 patients (two urine and one fecal sample per patient) before and after transrectal biopsy of the prostate.
- DNA was extracted from urine collected after a prostate massage before and after prostate biopsy, and from fecal samples collected before the biopsy.
- DNA was sequenced using the bacterial 16S rRNA high-throughput next generation sequencing, and we analyzed changes in microbial profiles for taxonomy comparison between samples.

RESULTS

- Pre-biopsy urinary microbial profiles contained lactobacillales and staphylococcaceae bacteria.
- Post-biopsy urinary microbial profiles included lower levels of lactobacillales and higher levels of bacteroidales bacteria.
- Bacteroidales bacteria were predominant in fecal samples.
- We identified two clustering patterns containing both pre- and post-biopsy urine samples using principal component analysis (PCoA). Cluster 1 had a urine cluster pattern that was distinct from fecal, while cluster 2 was similar to fecal.
- We observed two different modes of microbial changes, 11 patients had both of their urine (pre and post) samples associated with a particular cluster group, while others (n=15) had movement between clusters 1 and 2 following the biopsy procedure.

CONCLUSIONS

We describe two models of change in the urinary tract microbiota after prostate biopsy using 16S RNA gene analysis. Further research to determine what controls changes in the urinary microbiota after prostate biopsy can help us understand why some patients are more susceptible to develop post-biopsy infections.