A National Study of IBD Patients Diagnosed with Prostate Cancer: The Microbiome Link and Prevalence

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Introduction

- There is limited data exploring the risk of prostate cancer in patients with inflammatory bowel disease (IBD).

Objective

- To compare the prevalence of prostate cancer in men with ulcerative colitis (UC) versus Crohn's disease (CD).
- To determine any differences in the microbiota of prostate cancer patients with UC versus CD.

Methods

- The National Inpatient Sample from 2009 to 2014 was queried for hospitalizations of males over 18 years of age with diagnoses of IBD (specifically UC and CD).
- Of these IBD patients, those with UC were selected as cases and those with CD were selected as controls.
- A case-control matching at a ratio of 1 case to 1 control was performed based on age, race,and comorbidities. The primary outcome was the prevalence of prostate cancer in the UC and CD groups.
- Microbiome taxonomy results were obtained via the NCBI Taxonomy database.
- Statistical analysis was performed using IBM Statistical Package for the Social Sciences (SPSS) and R.

Results

Table 1: Microbiota associated with prostate cancer

Bacterial Genus	Prevalence
Escherichia	↑
Propionibacterium	↑
Pseudomonas	↑
Proteobacteria	↑

Table 2: Microbiota associated with ulcerative colitis

Bacterial Genus	Prevalence
Firmicutes	↓
Gammaproteobacteria	↑

Table 2: Microbiota associated with Crohn's disease

Bacterial Genus	Prevalence
Lachnospiracae	↓
Ruminococcaceae	↓
Ruminococcus	↑

- A total of 134916 weighted hospitalizations with IBD diagnosis codes were identified of which 4103 were diagnosed with prostate cancer.
- Pr prevalence was 51.2% among men with UC and 48.8% in patients after matching 1:1 ($p<0.001$).

Conclusion

- Men with IBD had high rates of diagnosed prostate cancer. Patients with UC had an even higher prevalence of prostate cancer as compared with patients with CD.
- This study was limited by the use of a retrospective admission database which could miss all the IBD patients with prostate cancer who were not admitted to the hospital.
- Our study provides evidence of a care, bacteria-rich prostate microbiome. The increased bacterial content/richness within the UC and CD microbiomes, together with elevated tumor mutational burdens, suggest the presence of a bacteria-driven oncogenetic process.
- Microbiota dysbiosis as seen in IBD may affect the intestinal mucosal immune system and, in turn, immune system dysfunction can lead to prostate cancer. More research needs to be done in UC and CD patients with prostate cancer

Financial Disclosures

- There are no relevant financial disclosures to disclose by the authors.
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