



EAU22 | AMSTERDAM
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Cutting-edge Science at Europe's largest Urology Congress

EAU22 Press Release:

Gut microbes differ in men with prostate cancer

Researchers have found a significant difference in the gut microbiota of men with prostate cancer, compared with those who have benign biopsies. The study is presented at the European Association of Urology Annual Congress (EAU22), in Amsterdam. Although the finding is an association, it could partly explain the relationship between lifestyle effects and geographical differences in prostate cancer.

Gut microbiota are the collection of microbes in the gastrointestinal tract and they affect processes and mechanisms in the body. The state of gut microbiota has been linked to many conditions, even in organs that are far from the intestines, but their role in prostate cancer is not understood.

Professor Peter Boström and colleagues at the University of Turku (FI) used samples collected from patients on a prospective multi-centre clinical study (NCT02241122). They sequenced the gut microbiota of 181 men who were suspected to have prostate cancer and undergoing prostate cancer diagnostics. The microbiota samples were collected at the time of their prostate biopsies after MRI scans.

Sixty percent of the men were diagnosed with prostate cancer, and their gut microbiota profiles were significantly different to those who had benign biopsies. The men with cancer had increased levels of *Prevotella 9*, members of the family *Erysipelotrichaceae*, and *Escherichia-Shigella*, a pathogen that causes diarrhoea. They also had lower levels of *Jonquetella*, *Moryella*, *Anaeroglobus*, *Corynebacterium* and CAG-352 than men without.

Professor Boström says: “There are significant variations in prostate cancer rates around the world, which could be due to genetic factors or differences in healthcare policies, but also variance in lifestyle and diet. The difference in gut microbiota between men with and without prostate cancer could underpin some of these variations. More research is needed to look at the potential for using gut microbiota for both diagnostic and preventive strategies.”

Prostate cancer is the most common male cancer globally, but varying rates in different parts of the world are little understood. It is common in most Western countries and less common elsewhere. Though it is known to be hereditary, there is evidence that men who emigrate from low to high incidence areas have increased risk of prostate cancer in their lifetimes, and their offspring have the risk of the high incidence region.

Lars Dyrskjøt Andersen, Professor of Molecular Medicine at Aarhus University (DK) and member of the EAU22 Scientific Congress Committee of Urology says: “This is a striking finding from a large well conducted trial. We should be careful with observed associations when it comes to complicated epidemiology, and no cause-and-effect measures can be determined based on this, but certainly the gut microbiota could be an important area to investigate further to enhance our understanding of prostate cancer risk.”

-Ends-

Notes to editors:

About EAU22

Europe’s biggest urology congress will take place from 1-4 July 2022 in Amsterdam, The Netherlands. With nearly 1,300 abstracts presented and moderated live, the 37th Annual Congress of the European Association of Urology (EAU22) will be amongst Europe’s biggest medical congresses in 2022.

Clinicians, scientists, and patients will meet to discuss topics such as:

1. Prostate cancer: new developments to improve treatments of the most common male cancer
2. Urinary incontinence: a growing concern for the elderly population
3. Practice changing treatments for both bladder and kidney cancer
4. Prevention and treatment of urinary stones; 1 in 10 people (55 million adults in Europe) will form a stone at some point
5. Special track for representatives of patient advocacy group on Monday 4 July

...and many other conditions related to the male and female urinary tract system and male reproductive organs. Review the full scientific programme on the congress website.

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The abstract, **Gut microbiota signatures are associated with prostate cancer risk**, is presented at the European Association of Urology Annual Congress (EAU22), in Amsterdam on Monday 4 July, 2022.

Abstract:

A0949: Gut microbiota signatures are associated with prostate cancer risk

Introduction & Objectives

Prostate cancer (PC) is the most common cancer in men, but its incidence varies significantly geographically. In contrast, there is less variation in global detection

rates of indolent PC. Reasons for these observations may relate to differences in genetic factors and healthcare policies, but also differences in lifestyle, such as diet. Currently we do not properly understand how lifestyle affects PC risk. Gut microbiota, i.e. collection of all microbes in the gastrointestinal tract, is acknowledged to affect many metabolic pathways and pathogenetic processes in the human body. Further, the state of gut dysbiosis i.e. disequilibrium of the microbiota, has been linked to many pathological conditions, even in organs distant to intestines. As of today, the role of gut microbiota in prostate carcinogenesis is not well documented.

Materials & Methods

Within a clinical prospective multicenter trial (Multi-IMPROD, NCT02241122), the gut microbiota were assessed from 181 men with clinical suspicion of PC (PSA 2.5 to 20.0 µg/l, and/or an abnormal DRE) utilizing 16S rRNA gene sequencing (Illumina) from rectal swabs collected at the time of transrectal ultrasound biopsy after MRI. Microbiota sequences were assigned to operational taxonomical units (OTUs), and differential abundance analysis, α - and β -diversities, and predictive functional (PICRUSt) analyses were performed. Further, plasma steroid hormone levels were correlated to predicted microbiota functions.

Results

PC was diagnosed in 60% (108/181). Apart from less smoking among subjects with PC, there were no lifestyle differences between the benign and cancer groups. The gut microbiota profiles of men with PC differed significantly from those without cancer. For example, Prevotella 9, members of family Erysipelotrichaceae, and potentially pathogenic Escherichia-Shigella were increased, and e.g. Jonquetella, Moryella, Anaeroglobus, Corynebacterium and CAG-352 were reduced in PC cases. Predictive functional analyses revealed increased 5- α -reductase activity (5-AR), copper absorption and retinol metabolism as functional results of different microbiota. Plasma testosterone negatively correlated with predicted microbial 5-AR activity (Wilcoxon rank sum $p=0.057$) and in a subgroup of men taking 5-AR inhibitors ($n=17$), plasma estrone

($p=0.027$) and estradiol ($p=0.054$) levels were higher in men with predicted increased microbial 5-AR function.

Conclusions

Based on our knowledge, this is the largest and most detailed clinical trial studying the gut microbiota and PC. We demonstrated a significant difference in gut microbiota composition in men with PC compared to men with benign biopsies. It is of great interest, that steroid hormone metabolism is a potential mechanistic explanation. These findings could partly explain the association of lifestyle effects and geographical differences observed in PC and warrant further studies with potential for diagnostic and preventive strategies.