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Perspective

Utility of Anaerobic Urine Culture and Urine Infections Caused by Anaerobic Bacteria

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Abstract

There are very few reports of anaerobic bacteria causing urinary tract infections. Since anaerobic bacteria are genitourinary tract commensals, their presence in a urine sample makes it more difficult to make a conclusive diagnosis of an anaerobic UTI. The gold standard method for uropathogen detection, identification, and antibiotic susceptibility testing is known as standard urine culture. Nevertheless, routine urine cultures performed in an anaerobic environment were abandoned due to the challenges associated with identifying them as pathogens and the dearth of anaerobic UTI cases that had been documented. On the other hand, it's crucial to stress those culture-independent techniques like proteomics and molecular techniques can find anaerobes on a urine sample itself. Guidelines for the diagnosis and management do not mention anaerobes.

Keywords: Anaerobic Urinary Tract Infection, Anaerobic Bacteria, Molecular Methods, MalDI-ToF Ms Used Directly In Urine, Antimicrobial Susceptibility Testing, Treatment

INTRODUCTION

Accurate pathogen identification also becomes more crucial for successful UTI therapy as fastidious uropathogens and antibiotic resistance grow more widespread (Flores Mireles AL 2015). In order to treat patients with anaerobic UTIs, we reviewed the clinical setting, pathogen antimicrobial susceptibility, and therapy options (Andreu A 2008). We focused our search on instances with both a positive UCAA and a negative conventional urine culture because UCAA is a controversial topic (McIsaac WJ 2011). Rarely, urinary tract infections are caused by anaerobic bacteria (Lewis JF 1976). These microorganisms are well-known genitourinary tract commensals and colonisers, therefore they could easily contaminate or infect a midstream urine samples (Manoni F et al., 2009). These factors caused the routine urine culture performed in an anaerobic environment to be discontinued. However, numerous researches have shown that UCAA might be helpful in clinical settings (Karakukcu C 2012). In addition, UCAA and therapy based on the results of antimicrobial susceptibility testing might be necessary to have a good result (Sterry Blunt RE et al., 2015). Anaerobes are among the finicky pathogens that

can be readily missed by normal diagnostic techniques (Seng P et al., 2009). Anaerobic bacteria have been found at unanticipated infection sites more frequently with the development of molecular and proteomic technologies and anaerobic UTIs do not seem to be an exception (Ferreira L et al., 2010). In fact, anaerobic microorganisms have been found. Directly on asymptomatic and sick patients' urine samples (Tevenson LG 2010). We reviewed the scientific literature on UTIs brought on by anaerobic bacteria, which included case reports released since 1972, the majority of them after 2012.

DISCUSSION

We focused our search on case reports of anaerobic UTIs that had both a positive UCAA and a negative Standard Urine Culture because the latter is a disputed topic. The aim of this search was to gather and analyse data on the types, amounts, and effects of anaerobic bacteria in UTIs. A PubMed search was conducted using the terms "anaerobic bacteria," "urinary tract infections," "diagnostic," "antibiotic susceptibility," "therapy," "urinary tract microbiota," "biofilm," and "urine culture." 95 articles, the most of which

were authored in English and released between 2016 and 2022, provided the information that we used. UTIs caused by *C. perfringens* were reviewed systematically by Millard et al., who also reported a case. Seven patients had concomitant bacteremia, eight had EC, five had diabetes, two had malignancies, seven were older than 65, and three passed away. Similar to UTIs, patients with risk factors are more likely to get UTIs brought on by facultative gram-positive bacteria, including those that may require anaerobic incubation, like *Actinotignum shaalii* and *Gardnerella vaginalis*. There is a danger of anaerobic UTIs in several settings. Transurethral instrumentation. Catheterization and cancerous tumours one of the risk factors for transitional cell carcinoma, the most frequent form of bladder cancer, is a persistent urinary tract infection. These individuals' urine samples contained *Fusobacterium*, *enterococcus*, and *Bacterizes*. Urine samples from prostate cancer patients contained high quantities of a few anaerobes, such as *Enterococcus lactolyticus*, *Varibaculum cambriense*, and *P. lymphophilum*, as well as facultative uropathogens like *A. shaalii*. Seven patients with post-radical cystectomy infections were found to have anaerobes, including one with urosepsis whose blood and urine cultures revealed *Prevotella* spp. Infertile men's prostatic massages and Transrectal ultrasound-guided prostate biopsies were both followed by anaerobic bacteriuria. Anaerobic UTI was discovered in renal transplant patients by Krieger JN.

CONCLUSION

Anaerobic UTI are also linked to altered microbiota in the urinary tract and vaginal area. It's possible for *G vaginalis*' adherent phenotype to be sexually transmitted. Some strains of this facultative bacterium may require anaerobic incubation since they can produce severe UTIs. Brightly coloured antibody was used to aspirate the bladder above the pubic bone. Five of the 34/593 pregnant women with anaerobic bacteriuria *villanelle parulis anaerobia's*, *Lactobacillus minutes*, and *Clostridium putrefactions* were FA-positive. According to the test's findings, these microorganisms are responsible for silent kidney illness. In a 58-year-old black woman with an obstructive calculus at the pelvic brim and hydro nephrosis, *Villanelle* sp. UTI was linked to ureteral blockage, which resulted in ascending infection fragile xanthogranulomatous pyelonephritis. According to reports, especially those from the paediatric population, anaerobic UTI and urinary tract blockage are closely related.

It is unknown if anaerobic urinary tract infections develop via the ascending path from the vaginal or gastrointestinal microbiota, which may be aided by the low oxygen tension in the urine.

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