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Clinical and Microbiological characteristics of chronic bacterial prostatitis

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Abstract
Chronic prostatitis (CP) is a very common urologic diagnosis in men, with 50% of men having this condition at some point in their life. About 10% of cases of CP have a bacterial etiology. The National Institutes of Health (NIH) classification four categories. Category II (CBP) is the focus of this article. Men with chronic bacterial prostatitis experience a similar loss in quality of life that survivors of recent acute coronary syndromes do. Chronic bacterial prostatitis (CBP) is characterized by prolonged or recurrent symptoms and relapsing bacteriuria. Diagnosis traditionally requires comparing urinary specimens obtained before with specimens obtained after prostatic massage. The main diagnostic criterion for CBP is positive bacterial cultures of prostatic fluid. Some patients may have bacterial infection despite negative urine cultures.

Our purpose in this study was the bacteriological examination of prostate fluid and urine taken from 105 patients (age 27to 50 years) with diagnosis of CBP who visited at TSMU the first university clinic Urology Department from 2017 january – until august 2017, identification of microbs and studying their sensitivity to antibiotics for the purpose of optimization of antibiotic therapy.

Our study show :1)The increasing prevalence of gram-positive pathogens(enterococci, staphylococci), 2) In most cases (98%) when patients had evidence of bacterial infection urine cultures were negative. 3) High resistance against fluoroquinolones (82%) in chronic bacterial prostatitis patients is a growing problem, that is why clinicians should consider local drug-resistance patterns.

Keywords: chronic bacterial prostatitis, prostatic fluid, urine, bacteria

Introduction

Prostatitis is the most common urologic problem in men younger than age 50 years. It is the third most common urologic problem in older men (1). About 10% of cases of CP have a bacterial etiology. The National Institutes of Health (NIH) classification four categories. Category II is the focus of this article.

Chronic bacterial prostatitis (CBP) is characterized by prolonged or recurrent symptoms and relapsing bacteriuria. Diagnosis traditionally requires comparing urinary specimens obtained before with specimens obtained after prostatic massage.Escherichia coli accounts for up to 80% of cases of (CBP) and other gram-negative Enterobacteriaceae. Enterococci are present in 5%-10% of prostate infections and maintains a condition of lower urinary tract infection that triggers multiple disorders. The gram-positive organisms that typically colonize the anterior urethra (ie, Staphylococcus epidermidis, *S*.saprophyticus, Streptococcus, Cirynebacterium, and Bacteroides) may represent contamination when present in a culture specimen, and their role in prostatic inflammation remains unclear (4). Bacterial P-fimbriae facilitate colonization of the lower urinary tract by binding e development of cystitis and prostatitis. Biofilm formation by bacteria allows the bacteria to persist despite antibiotic treatment. Biofilms are protective aggregates of bacteria that form in response to host defenses or antibiotic therapy; in prostatitis, they develop deep in the ducts of the prostate. Chronic bacterial prostatitis (CBP) or chronic prostatitis category II (5) is defined in men with documented recurrent urinary tract infections (UTI) who may be asymptomatic between episodes, or may preto urothelial receptors. E coli has mannose-sensitive fimbria with receptors that has been associated with thsent chronic genitourinary pain for more than 3

months in association with bacterial isolation from the prostate. About 10% of cases of CP have a bacterial etiology (5, 6, 7).

After an episode of acute bacterial prostatitis, approximately 5% of patients may progress to CBP. Patients may present with a history of relapsing urinary tract infections (UTIs), which may be episodic or persistent. The UTIs are typically not associated with systemic signs of infection. Other irritative or obstructive urologic symptoms may also be present (8,9,10). Analysis of urine specimens and prostatic fluid is used to confirm the diagnosis. In 1968, Meares and Stamey described the four-glass test, which continues to be the reference standard test for CBP. This test localizes the inflammatory and bacteriologic focus along the lower urinary tract and prostate (11,12). The cost, inconvenience and discomfort to patients, however, decrease its feasibility in practice: a survey of U.S. urologists found that 80% hardly ever used the Meares and Stamey test to diagnose CBP (13,14). Simpler tests including modifications of the original technique such as the pre and post massage test (15,16), expressed prostatic secretion culture, semen culture, and urine culture, while more feasible, convenient, or inexpensive, seem unsatisfactory alternatives. The reported sensitivity of semen culture to the diagnosis of CBP varies between 10 and 100%, and that of urine culture is 10%. The main diagnostic criterion for CBP is positive bacterial cultures of prostatic fluid. There is also often leukocytosis in prostatic fluid, which represents prostatic inflammation but is not specific to CBP (17). Some patients may have bacterial infection despite negative urine cultures. Bacteriological examination of the prostate gland secretion is held to determine the causes of the inflammatory process. Normally, secretion may contain small amounts of bacteria which are not pathogenic. For bacteria, which can lead to infectious processes are: Streptococci, Staphylococci, Klebsiella, Escherichia, Pseudomonas aeruginosa (18).

Our purpose in this study was the bacteriological examination of prostate fluid taken from CPB patients, identification of microbs and studying their sensitivity to antibiotics for the purpose of optimization of antibiotic therapy.

Material and Methods

This study consists of 105 patients (age 27to 50 years) with diagnosis of CBP who visited at TSMU the first university clinic Urology Department from 2017 january – until august 2017 with compliance of lower urinary tract symptoms: dysuria, pain in lower back and perineal area radiating to the testicle. A clean voided terminal stream urine sample was collected for complete urinalysis and bacterial culture. The prostate gland was then immediately massaged and expressed secretions were collected for culture under sterile conditions. Bacteriological examination material (secret) were seeded on nutrient medium, which were incubated overnight at 37°C in normal air with 5% CO_2. The microorganisms were identified by gram stain, oxidase, catalase and other biochemical tests using Bio-Mérieux products (API Staph, API 20E, API20 Strep, API 20 NE, Bio-Mérieux). The cultures which grew only rare coagulase-negative staphylococci or diphtheroids were interpreted as negative, as these organisms were considered non-pathogenic and probably represented contaminants.

Sensitivity of microorganisms to antibiotics was defined with Kirby-Bauer disc-diffusion method using standard discs (EUCAST guidelines 2017). Antibiotic susceptibility test was done on following antibiotics: amoxicillin+clavulanic acid, ampicillin+sulbactam, amikacine, norfloxacine, ciprofloxacine, levofloxacine, moxifloxacine, fosfomycine, doxycycline, azithromycine, nitrofurantoin, thrimethoprim-sulfamethoxazole.

Results

The prostatic fluid culture were considered positive when the number of colonies was $\geq 10^4$ CFU ml^{-1} in case of gram positive cocci and $\geq 10^5$ CFU ml^{-1} in case of gram negative rods. Bacteriological investigation of prostatic fluid yelded in 56 patients Enterococcus faecalis (53,3%), Staphylococcus aureus 32(30,5%), Streprococcus anginosus 5(4.8%), Enterobacter cloacae 6(5,7%), Escherichia coli 5(4,8 %), Klebsiella pneumonia 1(0,9%). Only two patients had positive urine culture with same bacterial isolate which were in prostatic fluid (Enterococcus faecalis). Polymicrobial growth was observed in 6 cases with Enterobacter cloacae and Escherichia coli (3cases), Enterococcus faecalis and Staphylococcus aureus (2 cases), Enterococcus faecalis and Escherichia coli (1 case). Both gram positive and gram negative organisms were sensitive to ampicillin-sulbactam, amoxicillin-clavulanic acid and amikacin.There was a total of 82% resistance to ciprofloxacin and levofloxacin and only 56% was resistant to moxifloxacine, 94% resistant to co-trimoxazole, only 5% were shown resistance to fosfomycine and nitrofurantoin. 59% were resistant to doxycycline.

Conclusion

Our study Show: 1) the increasing prevalence of gram-positive pathogens (enterococci, staphylococci), that may represent changing disease epidemiology (perhaps related to fluoroquinolone therapy) (or acceptance of their pathogenicity by health care providers.2) in most cases (98%) when patients had evidence of bacterial infection urine cultures were negative. Negative culture results may occur for various reasons, including insufficient sample volume, initiation of antibiotics prior to obtaining an expressed prostatic secretion sample, and the presence of fastidious organisms.3) High resistance against fluoroquinolones (82%) in chronic bacterial prostatitis patients is a growing problem, which is related to wide usage of antibiotics of this group in treatment of genitourinary tract infections, that is why clinicians should consider local drug-resistance patterns.

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