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Research Article

Chronic Prostatitis and Causative Organisms

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Abstract
Background: Chronic prostatitis is a frequently encountered urological condition with a heterogeneous etiology. While gram-negative bacteria remain the predominant causative agents, atypical and sexually transmitted organisms contribute significantly to disease burden, particularly in sexually active men.
Objective: To identify the spectrum of causative organisms in patients diagnosed with chronic bacterial prostatitis using conventional culture and nucleic acid amplification tests (NAAT).
Materials and Methods: This prospective observational study was conducted between March 2023 and November 2025 at a tertiary care hospital. Men aged 20–50 years presenting with recurrent urinary tract infection and genitourinary symptoms suggestive of chronic prostatitis were included. Patients with acute prostatitis or without identifiable organisms were excluded. All patients underwent detailed clinical evaluation, urine culture, expressed prostatic secretion analysis, and NAAT for sexually transmitted pathogens when indicated.
Results: A total of 146 patients were diagnosed with chronic bacterial prostatitis. *Escherichia coli* was the most common organism isolated on conventional culture (41%). NAAT identified atypical and sexually transmitted organisms in 10.9% of cases, predominantly *Chlamydia trachomatis*. Patients with multiple sexual partners showed a higher prevalence of atypical organisms.
Conclusion: Chronic prostatitis has a diverse microbiological profile. Along with conventional urine culture, NAAT improves detection of atypical and sexually transmitted pathogens and should be incorporated into diagnostic protocols for appropriate management.

Keywords: Chronic Prostatitis, Bacterial Prostatitis, NAAT, Escherichia Coli, Sexually Transmitted Infections.

Introduction

Chronic prostatitis is a common inflammatory condition of the prostate and constitutes a significant proportion of urology outpatient consultations worldwide. In the United States alone, nearly two million men seek medical attention annually for prostatitis-related symptoms, highlighting its considerable healthcare burden (1). Despite its high prevalence, the etiopathogenesis of chronic prostatitis remains incompletely understood, leading to diagnostic challenges and variable treatment outcomes.

Several factors have been implicated in the development of chronic bacterial prostatitis, including anatomical abnormalities of the lower urinary tract, prior instrumentation, defective host immunity, associated comorbidities such as diabetes mellitus, and persistent microbial exposure (2,3). Granulomatous prostatitis represents a distinct pathological entity and has been associated with HIV infection and intravesical Bacillus Calmette–Guérin (BCG) therapy for bladder cancer (4). Tubercular prostatitis, although rare, is more commonly encountered in developing countries and immunocompromised individuals (5).

Gram-negative organisms continue to be the most frequently isolated pathogens, with *Escherichia coli* accounting for the majority of cases (6,7). *Enterococcus*, *Proteus*, *Klebsiella*, and *Pseudomonas* species have also been reported in varying proportions (8).

In recent years, increasing attention has been directed toward atypical and sexually transmitted organisms such as *Chlamydia trachomatis*, *Mycoplasma* species, *Ureaplasma urealyticum*, and *Neisseria gonorrhoeae*, particularly among sexually active men (9,10). These organisms are often not detected by routine urine culture. The introduction of nucleic acid amplification tests (NAAT) has significantly enhanced diagnostic yield by

identifying pathogens that would otherwise remain undetected, thereby allowing targeted therapy and improved clinical outcomes (11).

Aims and Objectives

To identify and analyze the causative organisms responsible for chronic prostatitis using conventional culture techniques and nucleic acid amplification tests.

Materials and Methods

This prospective observational study was conducted between March 2023 and November 2025 at a tertiary care hospital. Male patients aged 20–50 years presenting with recurrent urinary tract infections and genitourinary discomfort suggestive of chronic prostatitis were enrolled. Patients with acute prostatitis and those in whom no causative organism could be isolated were excluded.

All patients underwent detailed history taking with emphasis on sexual behavior, prior urinary tract infections, and history of urological instrumentation. A thorough clinical examination was performed. Baseline investigations included hemogram, renal function tests, and radiological evaluation of the genitourinary tract.

Pre- and post-prostatic massage urine samples were collected. Expressed prostatic secretions were examined microscopically for inflammatory cells. Urine samples were subjected to culture and antibiotic sensitivity testing using standard microbiological techniques.

In patients with a history of multiple sexual partners and negative routine culture reports, urethral swabs and first-catch urine samples were analyzed using nucleic acid amplification tests to detect *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Mycoplasma* species, and *Trichomonas vaginalis*.

Statistical Analysis:

Data were analyzed using descriptive statistics. Categorical variables were expressed as frequencies and percentages.

Results

A total of 146 patients were diagnosed with chronic bacterial prostatitis. The age ranged from 22 to 50 years, with the majority (25–45 years) being sexually active. Forty-two patients reported a history of multiple sexual partners. Five patients had a history of urinary tract instrumentation or surgery for stone disease, and two patients had uncontrolled diabetes mellitus. One patient was diagnosed with granulomatous prostatitis secondary to Mycobacterium tuberculosis following intravesical Bacillus Calmette–Guérin therapy.

Table 1: Distribution of organisms isolated on conventional urine culture

Organism	Number of cases	Percentage
Escherichia coli	60	41.0
Enterococcus	45	30.8
Proteus	15	10.2
Klebsiella	8	5.4
Pseudomonas	2	1.3

Sixteen patients with negative routine urine culture were subsequently diagnosed with atypical organisms using nucleic acid amplification tests (NAAT).

Table 2: Atypical organisms detected by nucleic acid amplification tests

Organism	Number of cases	Percentage
Chlamydia trachomatis	10	6.8
Neisseria gonorrhoeae	2	1.3
Mycoplasma species	3	2.0

Table 3: Risk Factors Associated With Chronic Prostatitis

Risk factor	Number of patients	Percentage
Multiple sexual partners	42	28.8
Prior urinary instrumentation	5	3.4
Diabetes mellitus	2	1.4

Table 4: Distribution of organisms by diagnostic modality

Diagnostic method	Typical organisms	Atypical organisms
Urine culture	130	–

NAAT	–	16

Discussion

Chronic bacterial prostatitis continues to pose diagnostic and therapeutic challenges due to its heterogeneous etiology and the limited sensitivity of routine diagnostic methods. Consistent with previous studies, *Escherichia coli* was the most frequently isolated organism in the present study (1,6,7). Other gram-negative and gram-positive bacteria such as *Enterococcus*, *Proteus*, and *Klebsiella* were also commonly identified, underscoring the polymicrobial nature of this condition (8).

The role of atypical and sexually transmitted organisms in chronic prostatitis has gained increasing recognition. Earlier reports have documented a prevalence ranging from 3% to 30%, depending on the population studied and diagnostic methods used (4,9). In the present study, atypical organisms were detected in approximately 10–12% of patients, with *Chlamydia trachomatis* being the most common.

NAAT has emerged as a valuable diagnostic tool for identifying pathogens that are not detectable on conventional culture (5,11). Its use enables early and accurate diagnosis, allowing targeted antimicrobial therapy and reducing the risk of persistent or recurrent symptoms. Risk factors such as recurrent infections, incomplete treatment of acute prostatitis, bladder outlet obstruction, diabetes mellitus, and prior urological instrumentation have been consistently associated with chronic prostatitis and were also observed in the present study (3,5).

One patient developed granulomatous prostatitis due to *Mycobacterium tuberculosis* following intravesical BCG therapy, a recognized but uncommon complication (4). Early recognition and appropriate antitubercular therapy resulted in favorable outcomes.

Conclusion

Chronic prostatitis exhibits a broad microbiological spectrum. Along with common gram-negative organisms, atypical and sexually transmitted pathogens should be actively considered. The combined use of conventional culture and NAAT enhances diagnostic accuracy and facilitates appropriate, targeted management of chronic prostatitis.

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