# Prostatitis

## Diagnosis and treatment

Gretchen Dickson

Prostatitis is a spectrum of disorders that impacts a significant number of men. Acute bacterial prostatitis may be a life-threatening event requiring prompt recognition and treatment with antibiotic therapy. Chronic bacterial prostatitis has a more indolent course and also requires antibiotic therapy for resolution. Chronic prostatitis/chronic pelvic pain syndrome is the most common manifestation of prostatitis and may be the most difficult to treat. Asymptomatic inflammatory prostatitis is an incidental finding of unclear significance. Understanding the diagnostic and management strategies for each of these entities is critical for general practitioners in caring for their male patients.

**Keywords**
prostatitis; bacterial infections; pelvic pain

Up to 8% of Australian men report having urogenital pain at any given time, with 15% of men suffering from symptoms of prostatitis at some point during their lives.[1,2] In addition to causing impaired quality of life, men who have a history of prostatitis have increased rates of benign prostatic hyperplasia, lower urinary tract symptoms and prostate cancer.[1,3]

Prostatitis encompasses four distinct clinical entities, which can be described using the National Institutes of Health International Prostatitis Collaborative Network classification system. The four categories of prostatitis are:

- acute bacterial prostatitis
- chronic bacterial prostatitis
- chronic prostatitis/chronic pelvic pain syndrome
  - inflammatory subtype
  - non-inflammatory subtype
- asymptomatic inflammatory prostatitis.[4]

## Acute bacterial prostatitis

Acute bacterial prostatitis (ABP) accounts for approximately 5% of cases of prostatitis cases.[1] Although rare, ABP requires prompt recognition and treatment as it may result in sepsis. Acute bacterial prostatitis results from proliferation of bacteria within the prostate gland following intraprostatic reflux of urine infected with organisms such as *Escherichia coli, Enterococcus* and *Proteus* species.[5,6] Men with chronic indwelling catheters, diabetes mellitus, immunosuppression, or who intermittently perform self-catheterisation, are at higher risk of developing ABP due to their increased risk of bacterial colonisation of the urethra.[6,7] There is no evidence that perineal trauma from bicycle or horseback riding, dehydration or sexual abstinence are risk factors for ABP.

The clinical presentation of ABP may be highly variable with symptoms ranging from mild to severe.[6] Classic symptoms include:

- fever
- chills
- perineal or lower abdominal pain
- dysuria
- urinary frequency
- urinary urgency
- painful ejaculation
- hematospermia.[8]

Acute bacterial prostatitis should be considered in the differential diagnosis of any male presenting with urinary tract symptoms. While gentle palpation of the prostate gland on physical examination will often reveal a pathognomonic finding of an exquisitely tender, boggy prostate gland, care should be taken to avoid vigorous prostate massage as this may precipitate bacteremia and sepsis.[9]

Acute bacterial prostatitis can be diagnosed clinically, although both urine Gram stain and urine culture are recommended to identify causative organisms and guide treatment. While blood cultures and C-reactive protein may prove useful, a prostate specific antigen (PSA) test is not indicated. Prostate specific antigen elevations are common in the setting of infection and may take up to 1 month postinfection to resolve. Imaging is only indicated when prostatic abscess is suspected in a patient with ABP who is failing to improve with treatment.

Antibiotic therapy for ABP should be based on the acuity of the patient and the known or suspected causative organism. *Table 1* outlines the Australian *Therapeutic Guidelines* current treatment recommendations. While ABP is usually caused by urinary pathogens, sexually transmissible infections such as chlamydia and gonorrhoea should be considered, particularly in young men. If chlamydia is thought to be the causative agent, azithromycin 1 g orally stat or doxycycline 100 mg orally twice daily for 7 days is appropriate. If gonorrhoea is suspected, ceftriaxone 500 mg intramuscularly and azithromycin 1 g orally is indicated. Contact tracing, notification and treatment is also important in these cases.

In addition to antibiotic therapy, non-steroidal anti-inflammatory drugs (NSAIDs) may offer both analgesia and more rapid healing through liquefaction of prostatic secretions.[6]

Urine culture 48 hours post-treatment is useful combined with review after 7 days of antibiotic treatment to assess clinical response to treatment.

If the patient fails to improve with antibiotics, a prostatic abscess should be suspected, particularly in men who are immunocompromised, have diabetes mellitus or who have had recent instrumentation of the urinary tract.[10] Both computed tomography (CT) and transrectal ultrasound may be used to detect a prostate abscess.[11] If perineal puncture of the abscess is planned, ultrasound may guide the procedure.[12] However, if surgical debridement of the abscess is planned, a CT scan may be more helpful to define borders of the abscess, plan the surgical approach and to investigate for other abnormalities in the genitourinary system.[12]

Acute urinary retention may develop as a complication of ABP. Suprapubic tap should be performed to alleviate retention as urethral catheterisation may worsen infection and is contraindicated. In addition to acute urinary retention and prostatic abscess, ABP can lead to sepsis, chronic bacterial prostatitis, fistula formation or spread of infection to the spine or sacroiliac joints.[6,13]

**Table 1. Treatment of acute and chronic bacterial prostatitis[40]**

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| **Acute bacterial prostatitis** | **Mild or moderate disease while awaiting culture**<br>• Trimethoprim 300 mg orally daily for 14 days, or<br>• Cephalexin 500 mg orally twice daily for 14 days, or<br>• Amoxicillin and clavulanic acid 500 mg + 125 mg orally twice daily for 14 days<br>**Appears septic or unable to tolerate oral therapy**<br>• Admit to hospital, offer parenteral therapy with ampicillin and gentamycin or ceftriaxone as per severe pyelonephritis treatment |
| **Chronic bacterial prostatitis** | **First line treatment**<br>• Norfloxacin 400 mg orally every 12 hours for 4 weeks, or<br>• Trimethoprim 300 mg orally daily for 4 weeks<br>**If chlamydia or ureaplasma noted**<br>• Doxycycline 100 mg orally every 12 hours for 2–4 weeks |

## Chronic bacterial prostatitis

Chronic bacterial prostatitis (CBP) may result from ascending urethral infection, lymphogenous spread of rectal bacteria, hematogenous spread of bacteria from a remote source, undertreated acute bacterial prostatitis or recurrent urinary tract infection with prostatic reflux. Causative agents of CBP are similar to those of ABP include Gram negative rods, fungi, mycobacterium, *Ureaplasma urealyticum*, *Chlamydia trachomatis*[14] and *Trichomonas vaginalis*.[15] However, *Escherichia coli* is believed to be the causative organism in 75–80% of CBP cases.[14]

Recognising CBP can be difficult, as the history and examination are highly variable. All patients note some degree of genitourinary pain or discomfort. Common presentations include recurrent urinary tract infections with no history of bladder instrumentation, dysuria and frequency with no other signs of ABP or new onset sexual dysfunction without other aetiology.[16,17]

Often the physical examination, including prostate examination, is normal. Prostate examination should be performed to document any abnormalities such as prostatic calculi, which can serve as a reservoir of infection. Prostate stones may be difficult to palpate, but if found, may impact management decisions.

Although the Meares-Stamey four glass test is the gold standard to diagnose CBP, it is rarely used in practice due to time constraints and the difficulty obtaining samples.[18] Instead pre- and post-prostatic massage urine samples for analysis and culture may be useful and can guide antibiotic therapy.[19] A prostate massage is performed by stroking the prostate with firm pressure from the periphery to the midline on both the right and left sides of the prostate gland. More than 20 leucocytes per high powered field on the post-massage urine sample is diagnostic of CBP.[19] If urine cultures show no growth, consider a nucleic acid test for *C. trachomatis* and culture of prostatic fluid for ureaplasmas. Occasionally, *Mycoplasma genitalium* is found in prostatic secretions, although its role in prostatitis is unclear. If these tests are also negative, an alternative diagnosis should be considered.

Limited comparative trials exist to guide antibiotic regimens for CBP. *Table 1* lists current recommendations. Patients should be warned about the common side effects of extended duration of antibiotic use, such as Achilles tendon rupture with fluoroquinolones.

In addition to antibiotics, NSAIDs may alleviate pain symptoms. Alpha-blockers may diminish urinary obstruction and reduce future occurrences.[20] Although less well studied, saw palmetto, quercetin, daily sitz baths, perianal massage and frequent ejaculation may also help to clear prostatic secretions and lessen discomfort. If prostatic stones are present, prostatectomy may eliminate the nidus of infection.

## Chronic prostatitis/chronic pelvic pain syndrome

Chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) is more common than either acute bacterial or chronic bacterial prostatitis.[4] Up to 18% of Australian men may experience some type of urogenital pain within a 12 month period,

while up to 2% of Australian men may have prostatitis-like symptoms at any given time.[1,21] Unlike bacterial prostatitis where a causative organism can be identified, the aetiology of CP/CPPS is poorly understood; both inflammatory and infectious mechanisms have been postulated.[17,22,23] Psychological stress may be a major contributor to symptom severity.[24] Some evidence exists of an association between irritable bowel syndrome, chronic fatigue syndrome and fibromyalgia with CP/CPPS, although little correlation exists between the amount of inflammatory markers detected within the prostate gland itself and the degree of symptoms.[25,26]

Symptoms of CP/CPPS can vary widely and include dysuria; urinary frequency; urinary urgency; weak urinary stream; pain in the perineum, lower abdomen, testicles or penis; hematospermia or difficulty achieving erection.[27,28] Diagnosis requires the patient to have had pelvic pain or urinary symptoms for more than three of the previous 6 months with no evidence of ABP or urinary tract infection in that time.[17]

Chronic prostatitis/chronic pelvic pain syndrome is a diagnosis of exclusion and laboratory or imaging studies are indicated to rule out other potential causes of symptoms. Elevated PSA should not be attributed to CP/CPPS and warrants further investigation.[29]

Approximately 60% of men affected by CP/CPPS will seek treatment for their symptoms.[30] Although various treatments have been studied, methodological problems including lack of randomisation and small sample size limit the ability to apply research findings to the clinical treatment of CP/CPPS. With the current evidence available, tailoring treatment to individual patient symptom complexes may be more beneficial than attempting to use one treatment as a curative agent in all individuals.[31] The National Institute of Health Chronic Prostatitis Symptom Index (NIH-CPSI) provides a validated indicator of disease severity that can be monitored over time to determine if a particular treatment is improving a patient's symptoms or overall quality of life.[32]

Of the treatments that have been studied, alpha-adrenergic receptor blockers and antibiotics used alone or in combination appear to have the greatest improvement in symptom scores when compared with placebo.[33,34] Anti-inflammatory medications may also be useful.[33]

Additional studies are needed to determine the role of 5 alpha-reductase inhibitors, glycosaminoglycans, saw palmetto, acupuncture, physical therapy, and pelvic floor training using biofeedback as part of treatment.[17,35]

Other treatments that have proven useful in small studies for targeted symptoms include: phosphodiesterase five inhibitors for sexual dysfunction,[36] cernilton or pollen extract for urinary symptoms,[37] quercetin (500 mg orally twice daily for 30 days) for pelvic floor muscle spasm,[38] and fluoxetine (20 mg orally daily) for depression and improved quality of life.[39] Transurethral microwave therapy may be used as a last resort for men who have failed other interventions.[17]

## Asymptomatic inflammatory prostatitis

Asymptomatic inflammatory prostatitis is, by definition, asymptomatic. It is often diagnosed incidentally during the evaluation of infertility or prostate cancer.[17] The clinical significance of category IV prostatitis is unknown, and is often left untreated.[17]

## Summary

A diagnosis of prostatitis encompasses a spectrum of disease: acute bacterial prostatitis, chronic bacterial prostatitis, chronic prostatitis/chronic pelvic pain syndrome and asymptomatic prostatitis have varying clinical significance, causative agents, treatment strategies and long-term prognosis.

Limited research exists to guide the diagnosis and management of these entities, making prostatitis a challenging condition to manage.

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