PROSTATITIS

An inflammation of the prostate gland.

Diagnosis Male

Related Diagnoses:
Erectile dysfunction Anejaculation Ejaculatory disorders Oligozoospermia Painful ejaculation Oligoasthenoteratozoospermia

About Prostatitis

The term prostatitis refers, in its strictest sense, to histological (microscopic) inflammation of the tissue of the prostate gland. Like all forms of inflammation, it can be associated with an appropriate response of the body to an infection, but it also occurs in the absence of infection.

Prostatitis is classified into acute, chronic, asymptomatic inflammatory prostatitis, and chronic pelvic pain syndrome.

1. Acute prostatitis

Acute prostatitis is a serious bacterial infection of the prostate gland. This infection is a medical emergency in some patients and hospitalization with intravenous antibiotics may be required. A complete blood count reveals increased white blood cells. Men with this disease often have chills, fever, pain in the lower back and genital area, urinary frequency and urgency often at night, burning or painful urination, body aches, and a demonstrable infection of the urinary tract, as evidenced by white blood cells and bacteria in the urine. Common bacteria are Escherichia coli, Klebsiella, Proteus, Pseudomonas, Enterobacter, Enterococcus, Serratia, and Staphylococcus aureus. C-reactive protein is elevated in most cases. Acute prostatitis is also associated with a transiently elevated PSA (Prostate specific antigen), i.e., the PSA is increased during an episode of acute prostatitis and then decreases again after it has resolved. PSA testing is not indicated in the context of uncomplicated acute prostatitis. Rectal palpation usually reveals an enlarged, exquisitely tender, swollen prostate gland, which is firm, warm, and, occasionally, irregular to the touch. A prostate massage should never be done in a patient with suspected acute prostatitis, since it may induce sepsis. Sepsis from prostatitis is very rare, but may occur in immunocompromised patients; high fever and malaise generally prompt blood cultures, which are often positive in sepsis.

2. Chronic prostatitis

Chronic bacterial prostatitis is a relatively rare condition. It is defined as recurrent urinary tract infections in men originating from a chronic infection in the prostate. Symptoms may be completely absent until there is also bladder infection, and the most troublesome problem is usually recurrent cystitis. Chronic bacterial prostatitis occurs in less than 5% of patients with prostate-related non-benign prostatic hyperplasia lower urinary tract symptoms (LUTS).

In chronic bacterial prostatitis there are bacteria in the prostate, but there may be no symptoms or milder symptoms than occur with acute prostatitis. The prostate infection is diagnosed by culturing urine as well as prostate fluid (expressed prostatic secretions or EPS) which are obtained by the doctor performing a rectal exam and putting pressure on the prostate. If no fluid is recovered after this prostatic massage, a post massage urine should also contain any prostatic bacteria. Prostate specific antigen levels may be elevated, although there is no malignancy. Semen analysis is a useful diagnostic tool. Semen cultures are also performed. Antibiotic sensitivity testing is also done to select the appropriate antibiotic. Other useful markers of infection are seminal elastase and seminal cytokines.
**Chronic non-bacterial prostatitis** or chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) is a pelvic pain condition in men. This condition was formerly known as prostatodynia (painful prostate). Chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) is characterized by pelvic or perineal pain without evidence of urinary tract infection, lasting longer than 3 months, as the key symptom. Symptoms may wax and wane. Pain can range from mild to debilitating. Pain may radiate to the back and rectum, making sitting uncomfortable. Pain can be present in the perineum, testicles, tip of penis, pubic or bladder area. Dysuria, arthralgia, myalgia, unexplained fatigue, abdominal pain, constant burning pain in the penis, and frequency may all be present. Frequent urination and increased urgency may suggest interstitial cystitis (inflammation centered in bladder rather than prostate). Post-ejaculatory pain, mediated by nerves and muscles, is a hallmark of the condition. Some patients report low libido, sexual dysfunction and erectile difficulties.

The symptoms of CP/CPPS appear to result from an interplay between psychological factors and dysfunction in the immune, neurological and endocrine systems. Theories behind the disease include stress-driven hypothalamic-pituitary-adrenal axis dysfunction and adrenocortical hormone (endocrine) abnormalities, neurogenic inflammation, and myofascial pain syndrome. In the latter two categories, dysregulation of the local nervous system due to past trauma, infection or an anxious disposition and chronic albeit unconscious pelvic tension lead to inflammation that is mediated by substances released by nerve cells (such as substance P). Bladder, urethra, testicles can become inflamed by the action of the chronically activated pelvic nerves on the mast cells at the end of the nerve pathways. Similar stress-induced genitourinary inflammation has been shown experimentally in other mammals.

The ambient temperature appears to play a role as cold is frequently reported as causing symptom aggravation and heat is often reported to be ameliorating. It appears that cold is one of the factors that can trigger a process resulting in CP/CPPS. Cold also causes aggravation of symptoms and can initiate a relapse. A survey showed that the occurrence of prostatitis symptoms in men living in northern Finland—a cold climate—is higher than that reported in other parts of the world. This could be partly caused by the cold climate.

Anecdotal evidence suggests that food allergies and intolerances may have a role in exacerbating CP/CPPS, perhaps through mast cell mediated mechanisms. Specifically, patients with gluten intolerance or celiac disease report severe symptom flares after sustained gluten ingestion. Patients may therefore find an elimination diet helpful in lessening symptoms by identifying problem foods.

There are no definitive diagnostic tests for CP/CPPS. This is a poorly understood disorder, even though it accounts for 90–95% of prostatitis diagnoses. It is found in men of any age, with the peak incidence in men aged 35–45 years. CP/CPPS may be inflammatory or non-inflammatory, based on levels of pus cells in expressed prostatic secretions (EPS), but these subcategories are of limited use clinically. In the inflammatory form, urine, semen, and other fluids from the prostate contain pus cells (dead white blood cells or WBCs), whereas in the non-inflammatory form no pus cells are present. Extraprostatic abdominal/pelvic tenderness is present in >50% of patients with chronic pelvic pain syndrome but only 7% of controls. Healthy men have slightly more bacteria in their semen than men with CPPS. Men with CP/CPPS are more likely than the general population to suffer from Chronic Fatigue Syndrome (CFS), and Irritable Bowel Syndrome (IBS).

3. **Asymptomatic inflammatory prostatitis**

Asymptomatic inflammatory prostatitis is a painless inflammation of the prostate gland where there is no evidence of infection. These patients have no history of genitourinary pain complaints, but leukocytosis is noted, usually during evaluation for other conditions. Diagnosis is through tests of semen, expressed prostatic secretion (EPS) or prostate tissue that reveal inflammation in the absence of symptoms.

4. **Granulomatous prostatitis**

Granulomatous prostatitis is an uncommon disease of the prostate. It is a form of prostatitis, i.e. inflammation of the prostate, resulting from infection (bacterial, viral, or fungal), the BCG- Bacillus Calmette-Guerin therapy (therapy which is used for bladder cancer), malacoplakia or systemic granulomatous diseases which involve the prostate. Prostatic secretions escape into the stroma and elicit an inflammatory response.

**Associated disease**

- hypothalamic pituitary adrenal axis dysfunction
- adrenocortical hormone abnormalities
- neurogenic inflammation
- myofascial pain syndrome
- chronic fatigue syndrome
- irritable bowel syndrome
Complications

- sepsis
- infertility

Risk factors

- prostate biopsy
- the ambient temperature
- food allergies and intolerances
- pelvic trauma
- dehydration
- unprotected sexual intercourse
- urinary catheter

Impact on fertility

Poor semen quality may be the most common cause of male infertility, and there is a general consensus that reduced fertility and poorer semen quality may be the result of male accessory gland infection. Studies have shown that the pathogenic bacteria, leukocytes, cytokines and reactive oxygen species (ROS) might be the primary mechanisms of infertility resulting from male accessory gland infection, and broad-spectrum treatment could reduce the density of leukocytes in semen and improve the ejaculates quality.

Prevention

For prevention is good to avoid coffee, spicy or acidic food and alcohol. To ease pressure on the prostate you should sit on a pillow and avoid long bicycling.

Symptoms

- chills
- fever
- pain in lower back and genital area
- urinary frequency
- urinary urgency at night
- burning or painful urination
- body aches
- infection of the urinary track
- increased white blood cells
- high fever
- enlarged, exquisitely, tender, swollen prostate gland
- pelvic pain
- constant burning pain in the penis
- back and rectum pain
- uncomfortable sitting
- testicular pain
- penile pain
- dysuria
- arthralgia
- myalgia
- unexplained fatigue
- abdominal pain
- post- ejaculatory pain
- low libido
- sexual dysfunction
- erectile difficulties

Therapies
Self therapy

Acupuncture

Acupuncture which has been used to treat painful and chronic conditions may be useful in the treatment of pain, urinary and quality of life (QOL) symptoms frequently seen in men with CP/CPPS. While the etiology, treatment, long-term effects on QOL and CP/CPPS as a predictor of future prostate disease are yet to be determined, the rationale for safe and effective treatment practices for this complex condition is needed.

Psychological and physical therapy

Chronic prostatitis may have no initial trigger other than anxiety, often with an element of OCD (obsessive-compulsive disorder), panic disorder, or other anxiety-spectrum problem. This is the orized to leave the pelvic area in a sensitized condition resulting in a loop of muscle tension and heightened neurological feedback (neural pain wind-up). Current protocols largely focus on stretches to release overtensed muscles in the pelvic or anal area (commonly referred to as trigger points) including digital intrarectal massage, physical therapy to the area, and progressive relaxation therapy to reduce causative stress.

Conventional medicine

Pharmacotherapy

Acute prostatitis

Antibiotics are the first line of treatment in acute prostatitis. Antibiotics usually resolve acute prostatitis infections in a very short time, however a minimum of two to four weeks of therapy is recommended to eradicate the offending organism completely. Appropriate antibiotics should be used, based on the microbe causing the infection. Some antibiotics have very poor penetration of the prostatic capsule, others, such as Ciprofloxacin, Co-trimoxazole and tetracyclines such as doxycycline penetrate well. In acute prostatitis, penetration of the prostate is not as important as for chronic prostatitis because the intense inflammation disrupts the prostate-blood barrier. It is more important to choose a bactericidal antibiotic (kills bacteria, e.g. quinolone) rather than a bacteriostatic antibiotic (slows bacterial growth, e.g. tetracycline) for acute potentially life-threatening infections.

Chronic prostatitis

Some tricyclic antidepressants and benzodiazepines could be used for chronic prostatitis.

Asymptomatic prostatitis

No treatment required.

Surgical therapy

To treat an infection that does not respond to antibiotic treatment transurethral prostatectomy can be used. The way is to take out the prostate through the urethral opening at the tip of the penis.

Assisted reproduction

Prostatitis itself does not lead to infertility, but there is significant correlation with influence on sperm parameters - such as sperm count, motility and morphology. Acute prostatitis can be healed without side effect on sperm, but chronic inflammation is responsible for defect in process of spermatogenesis. Leukocytes represent the predominant source of reactive oxygen species both in seminal plasma and in sperm suspensions and have been demonstrated to negatively influence sperm function and fertilization rate in ART. Therefore, sperm preparation methods prior IVF-ICSI should eliminate dead spermatozoa and other cells, including bacteria and leukocytes. Swim-up
and density-gradient centrifugation remain the most common methods used for the isolation of functionally normal spermatooza. In swim up technique are sperms selected by their motility and capability to swim out of the seminal plasma. It is the most common technique used in IVF laboratories in samples with normal number of good sperms. In cases of lower count of sperms density gradient centrifugation is used. Cells are selected during the centrifugation by their different density and motility, the sperms with high motility and good morphology are at the bottom of the tube, and dead spermatozoa, leukocytes, bacteria are on the top.

After the best sperms are obtained, they are injected into woman’s oocytes and resulting embryos are inserted into the womb during process called embryotransfer.
Urinary bladder
Hollow, expandable organ serving as a reservoir for urine prior to its expulsion from the body.
Learn more at: www.fertilitypedia.org/edu/organs/urinary-bladder

Reproductive cells

Sperm
A male reproductive cell which is able to fertilize the counterpart female gamete - the oocyte.
Learn more at: www.fertilitypedia.org/edu/reproductive-cells/sperm

Spermatogonium
An undifferentiated male germ cell with self-renewing capacity representing the first stage of spermatogenesis.
Learn more at: www.fertilitypedia.org/edu/reproductive-cells/spermatogonium

Biological control

Follicle-stimulating hormone
FSH is a hormone secreted by the anterior pituitary gland. It regulates the development, growth, pubertal matur and reproductive functions of the body.
Learn more at: www.fertilitypedia.org/edu/biological-control/follicle-stimulating-hormone

Testosterone
Steroid hormone produced primarily in the testes of the male; responsible for the development of secondary sex characteristics in the male.
Learn more at: www.fertilitypedia.org/edu/biological-control/testosterone

Reproductive functions

Ejaculation
Discharge of the semen (usually containing sperm) from the male reproductory tract, normally accompanied by orgasm.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/ejaculation

Erection
The physiological process by which a penis becomes erect by being engorged with blood.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/erection

Fertilization
The fusion of an ovum with a sperm to initiate the development of a new individual organism.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/fertilization

Spermatogenesis
Process in which spermatozoa are produced from male primordial germ cells in testicles by way of mitosis and meiosis.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/spermatogenesis

Symptoms

Chronic pelvic pain
Pain in the area of the pelvis, that lasts more than six months.
Learn more at: www.fertilitypedia.org/edu/symptoms/chronic-pelvic-pain-1

Fatigue
A subjective feeling of tiredness which is distinct from weakness, which has a gradual onset.
Learn more at: www.fertilitypedia.org/edu/symptoms/fatigue
Fever
A temperature above the normal range due to an increase in the body's temperature set-point.
Learn more at: www.fertilitypedia.org/edu/symptoms/fever

Frequent and urgent urination
The need to urinate more often than usual and a sudden, compelling urge to urinate.
Learn more at: www.fertilitypedia.org/edu/symptoms/frequent-and-urgent-urination

Inability to have or maintain an erection
The inability to develop or maintain an erection of the penis during sexual activity in humans.
Learn more at: www.fertilitypedia.org/edu/symptoms/ inability-to-have-or-maintain-an-erection

Infertility
The failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.
Learn more at: www.fertilitypedia.org/edu/symptoms/infertility

Low concentration of sperm
A condition refers to semen with a low concentration of sperm.
Learn more at: www.fertilitypedia.org/edu/symptoms/low-concentration-of-sperm

Lower back pain
A common painful disorder involving the muscles and bones of the back.
Learn more at: www.fertilitypedia.org/edu/symptoms/lower-back-pain

Lowered libido
The absence of sexual appetite.
Learn more at: www.fertilitypedia.org/edu/symptoms/lowered-libido

Painful sexual intercourse
The painful feelings during sexual intercourse.
Learn more at: www.fertilitypedia.org/edu/symptoms/painful-sexual-intercourse

Painful urination
A burning or stinging sensation during urination.
Learn more at: www.fertilitypedia.org/edu/symptoms/painful-urination-1

Penile pain
The pain in the base, shaft or head of the penis.
Learn more at: www.fertilitypedia.org/edu/symptoms/penile-pain

Reduced sperm motility
The decreased ability of sperm cell to move progressively.
Learn more at: www.fertilitypedia.org/edu/symptoms/reduced-sperm-motility

Sexual frustration
A frustration caused by a discrepancy between a person's desired and achieved sexual activity.
Learn more at: www.fertilitypedia.org/edu/symptoms/sexual-frustration

Testicular pain
A discomfort felt in the testicles (testes) or scrotum.
Learn more at: www.fertilitypedia.org/edu/symptoms/testicular-pain

Therapies
Acupuncture
A form of alternative medicine and a key component of traditional Chinese medicine involving thin needles inserted into the body at acupuncture points.
Learn more at: www.fertilitypedia.org/edu/therapies/acupuncture

Egg donation
Process by which a woman donates eggs for purposes of assisted reproduction or biomedical research.
Learn more at: www.fertilitypedia.org/edu/therapies/egg-donation

ICSI
A micromanipulative fertilization technique in which a single sperm is injected directly into an egg.
Learn more at: www.fertilitypedia.org/edu/therapies/icsi

Pharmacotherapy of prostatitis
Learn more at: www.fertilitypedia.org/edu/therapies/pharmacotherapy-of-prostatitis

Sperm donation
The procedure in which a man (sperm donor) provides his sperm for fertility treatment.
Learn more at: www.fertilitypedia.org/edu/therapies/sperm-donation

Standard IVF
A process in which an egg is fertilised by sperm outside the body: in vitro. Own or donated gametes may be used.
Learn more at: www.fertilitypedia.org/edu/therapies/standard-ivf

Gallery

Prostatic stroma
The prostatic stroma shows a dense inflammatory infiltrate and fibrosis.

Sources


“ The Effect of Chronic Bacterial Prostatitis on Semen Quality in Adult Men: A Meta-Analysis of Case-control Studies (http://www.nature.com/articles/srep07233)” —by Shang et al. licensed under CC BY 4.0.

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