Diagnosis and Treatment of Prostatitis

JMAJ 47(12): 561–565, 2004

Takashi DEGUCHI

Professor, Department of Urology, Gifu University School of Medicine

Abstract: Among various prostatic diseases, those presenting diverse symptoms including increased urinary frequency, feeling of incomplete emptying, difficulty in urination, perineal pain or discomfort, low back pain, and lower abdominal pain are categorized as prostatitis syndrome. Prostatitis syndrome is broadly divided into acute bacterial infection and chronic prostatitis, and the latter includes various forms of disease ranging from those involving bacterial infection to those accompanying no inflammatory reaction. Each of the disease groups classified in chronic prostatitis has been poorly understood with respect to etiology, pathology, diagnosis, and treatment. To tackle these diseases, new attempts are being made, including new classification, scoring of symptoms and their severity, the application of molecular biological techniques for diagnosis, and the development of treatment methods. Future developments are expected to lead to the elucidation of the etiology of chronic prostatitis through the accumulation of data, as well as the establishment of new evidence-based methods for diagnosis and treatment.

Key words: Acute bacterial prostatitis; Chronic bacterial prostatitis; Non-bacterial prostatitis; Prostatodynia

Introduction

Among the independent prostatic diseases that do not have any underlying disease in the genitourinary system, a group of disorders presenting diverse symptoms including increased urinary frequency, feeling of incomplete emptying, difficulty in urination, perineal pain or discomfort, low back pain, and lower abdominal pain are categorized as prostatitis syndrome. Drach et al. classify prostatitis syndrome into acute bacterial prostatitis, chronic bacterial prostatitis, non-bacterial prostatitis, and prostatodynia (Table 1).

In 1995, the National Institute of Health (NIH) in the U.S. proposed a new disease classification (Table 1). The NIH classification defines acute bacterial prostatitis as type I and chronic bacterial prostatitis as type II, while non-bacterial prostatitis and prostatodynia are combined in type III, chronic abacterial prostatitis or chronic pelvic pain syndrome. Type III...
Table 1  Classification of Prostatitis Syndrome

<table>
<thead>
<tr>
<th>Classification by Drach et al.</th>
<th>NIH classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute bacterial prostatitis</td>
<td>Type I: Acute bacterial prostatitis</td>
</tr>
<tr>
<td>Chronic bacterial prostatitis</td>
<td>Type II: Chronic bacterial prostatitis</td>
</tr>
<tr>
<td>Non-bacterial prostatitis</td>
<td>Type III: Chronic abacterial prostatitis (Chronic pelvic pain syndrome)</td>
</tr>
<tr>
<td>Prostatodynia</td>
<td>A: Inflammatory</td>
</tr>
<tr>
<td></td>
<td>B: Noninflammatory</td>
</tr>
<tr>
<td></td>
<td>Type IV: Asymptomatic inflammatory prostatitis</td>
</tr>
</tbody>
</table>

was further subdivided into inflammatory (type IIIA) and noninflammatory (type IIIB). The NIH classification created a new category of asymptomatic inflammatory prostatitis (type IV) to include cases lacking clinical symptoms and showing histopathological findings of inflammation or the presence of leukocytes in prostatic secretion tested for other diseases.

Usually, the term “acute prostatitis” refers to acute bacterial prostatitis, i.e., NIH type I, and the term “chronic prostatitis” refers to a group of diseases including chronic bacterial prostatitis, non-bacterial prostatitis, and prostatodynia, which correspond to NIH type II, type IIIA, and type IIIB, respectively. Even with this new classification, the etiology and pathology of diseases constituting chronic prostatitis have not been fully elucidated, and clinical severity determination and systematic treatment methods have not yet been established.

Under these circumstances, the NIH published the NIH Chronic Prostatitis Symptom Index. This index, designed to evaluate pain, discomfort, urination symptoms, and the effects of symptoms on daily life in scores, is expected to be used to determine severity and evaluate various treatment methods. A Japanese version of this index has been developed, and studies to examine its validity and usefulness have commenced. However, data based on these new approaches have not been accumulated sufficiently so far. This article outlines the clinical characteristics and treatment of various diseases in prostatitis syndrome according to conventional classification.

**Acute Prostatitis**

Acute bacterial prostatitis with rapid onset and development corresponds to type I in the NIH classification. This disease is caused by retrograde infection of bacteria from the urinary tract into the prostate. It starts abruptly with fever accompanying chills and shivering and bladder irritation symptoms, such as increased urinary frequency and miction pain, and eventually causes ejaculation pain, urinary disturbance, and sometimes urinary retention. Digital rectal examination reveals a swollen soft prostate presenting heat sensation and tenderness. Urine tests show pyuria and bacteriuria. Prostate massage is contraindicated during the acute phase because of the risk of inducing sepsis. First-voided urine or midstream urine is submitted to bacterial culture test for identification of causative bacteria.

Most of the bacteria causing acute bacterial prostatitis are Gram-negative bacilli, including *Escherichia coli* responsible for 60% of cases. Antibacterial chemotherapy with second and third generation cephems and carbapenems, which have potent antibacterial activity against *E. coli* and other potential causative bacteria, is effective, although penetration into the prostate is not always beneficial. New oral quinolones are considered useful in treating acute bacterial prostatitis because they have wide antibacterial spectra covering almost all caus-
ative bacteria and exert potent antibacterial activity.

The selection and switching of antibacterial agents are made based on the drug sensitivity of causative bacteria indicated by the bacteriological tests of urine. Generally, severe cases are first treated with a parenteral cephem or carbapenem, and switched to oral fluoroquinolones after the resolution of acute symptoms. Treatment for acute bacterial prostatitis should basically be in-patient care with infusion and intravenous antibacterial agents although mild cases may be treated on an outpatient basis using oral fluoroquinolones. The use of antibacterial agents should be continued for 4 to 6 weeks.

Chronic Prostatitis

Chronic prostatitis with gradual clinical progression is a group of conditions including chronic bacterial prostatitis, non-bacterial prostatitis, and prostatodynia. The diagnosis of each condition is made based on leukocyte counts and bacterial culture results in the urine and expressed prostatic secretion (EPS) collected by the Meares and Stamey method.5) (Table 2, Table 2: Diagnosis of Prostatitis Syndrome)

1. Chronic bacterial prostatitis

![Fig. 1 Meares and stamey method](Meares, E.M. and Stamey, T.A.: Invest Urol 1968; 5: 492–518)
Chronic bacterial prostatitis corresponds to type II in the NIH classification. According to the UTI Efficacy Evaluation Criteria in Japan,\textsuperscript{6} diagnosis as having this disease is made when microscopic examination of EPS or VB3 urinary sediment shows an increased leukocyte count of 10 or more per field, and bacterial culture results in the isolation of at least \(10^5\) CFU/ml Gram-negative bacilli or \(10^4\) CFU/ml Gram-positive cocci. The most frequently isolated bacteria are \textit{E. coli} among Gram-negative bacilli and \textit{Enterococcus} and \textit{Staphylococcus} species among Gram-negative cocci. However, bacteria are isolated only at a frequency of 5 to 10% from patients with diseases showing symptoms of chronic prostatitis. Digital rectal examination of the prostate does not show characteristic findings in most cases although it may reveal mild tenderness.

Fluoroquinolones are the first choice of antibacterial agents for chronic bacterial prostatitis because of their wide antibacterial spectrum, good penetration into prostatic tissues, and suitability for outpatient treatment. An antibacterial agent is administered first for 4 weeks. If a response is obtained, the regimen is continued for an additional 4 weeks. If no response is seen, the regimen is changed based on the type and drug resistance of bacteria cultured from VB3 or EPS. Because treatment usually requires a long time, the development of any side effects must be monitored carefully.

2. Non-bacterial prostatitis

In the NIH classification, non-bacterial prostatitis is classified as inflammatory type-IIIA disease in the category of chronic abacterial prostatitis without proof of infection. Diagnosis of this disease is made when the presence of inflammation is suggested by an increased leukocyte count of 10 or more per field in microscopic examination of EPS or VB3 urinary sediment, but when bacterial culture does not detect inflammation-causing bacteria.

The presumed causes of this disease include chlamydia, mycoplasma, ureaplasma, and other bacteria that do not grow in general bacterial cultures, as well as an inflammation reaction due to the intraprostatic reflux of urine, but the pathology of this disease has not been clarified. However, recent examination of bacterial genes in prostatic tissues using molecular biological methods for bacteria detection suggests that this disease may involve some forms of bacterial infection.\textsuperscript{7}

For this reason, antibacterial chemotherapy is attempted in treatment for non-bacterial prostatitis, similarly to treatment for chronic bacterial prostatitis. Fluoroquinolones are preferred as they have wide antibacterial spectra; exert antibacterial activity against chlamydia, mycoplasma, and ureaplasma, and show good penetration into prostatic tissues. Considering the possible involvement of chlamydia and other bacteria, the use of tetracyclines that are effective against these bacteria may also be an option.

An antibacterial agent is administered first for 4 weeks. If a response is obtained, the regimen is continued for additional 4 weeks. If the patient complains of difficulty in urination, the regimen is combined with an \(\alpha_1\)-blocker as used for prostatic hyperplasia or an anti-inflammatory plant extract. If he has symptoms of an unstable bladder, such as increased urinary frequency and urgency, anticholinergic drugs and smooth muscle relaxants are added to the regimen. In refractory cases, treatment for prostatodynia as discussed in the next section is incorporated.

3. Prostatodynia

In the NIH classification, prostatodynia corresponds to noninflammatory type-IIIB disease in the category of chronic abacterial prostatitis. Diagnosis of this disease is made when no leukocytes are observed on microscopic examination of EPS or VB3 urinary sediment, and no signs of inflammation are recognized.

Similarly to non-bacterial prostatitis, the etiology of this disease is unknown. Presumed
causes include psychogenic factors, pelvic vein congestion, and hypertonic pelvic floor muscles. When the involvement of psychogenic factors is strongly suspected, the use of minor tranquilizers and counseling are effective in some cases.

When the involvement of pelvic vein congestion is suspected because MRI or transrectal ultrasound tomography indicates the dilation of veins on the anterior surface of the prostate, in particular Santorini’s plexus, and when the condition is accompanied by hemorrhoids, such patients may benefit from a Chinese herbal medicine for resolving blood congestion (“oketsu”), such as keishi-bukuryo-gan (Cinnamon & Hoelen Formula). When hypertonicity of pelvic floor muscles is strong, low-frequency electrical acupuncture and moxibustion are attempted. In addition, thermotherapy as used for prostatic hyperplasia has been reported to be effective in non-bacterial prostatitis and prostatodynia.

The symptoms of chronic prostatitis often repeat improvements and exacerbations, and they resist treatment in many cases. Factors leading to the exacerbation of symptoms include drinking, driving, prolonged sitting for deskwork, fatigue, stress, and coldness. Some patients who feel discomfort or mild pain during ejaculation refrain from ejaculation for fear that ejaculation might aggravate the symptoms. However, ejaculation actually improves symptoms in many cases.

In view of the present situation in which treatment for chronic prostatitis has not been established, it is important for us to instruct patients to avoid or curtail factors that aggravate symptoms in daily life, as well as to encourage practices that ameliorate symptoms.

**Conclusion**

Among various disease groups categorized in prostatitis syndrome, those classified in chronic prostatitis have been poorly understood with respect to etiology, pathology, diagnosis, and treatment. To tackle these diseases, new attempts are being made, including new classification, scoring of symptoms and their severity, the application of molecular biological techniques for diagnosis, and the development of treatment methods.

Future developments are expected to lead to the elucidation of the etiology of chronic prostatitis through the accumulation of data, as well as the establishment of new evidence-based methods for diagnosis and treatment.

**REFERENCES**