Clinical Investigation on the Relationship between Upper Urinary Tract Obstruction and the Accompanied Chronic Cystitis

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Key Words
Upper urinary tract obstruction • Chronic cystitis • Association

Abstract
Objective: To explore the relationship between upper urinary tract obstruction and the accompanied chronic cystitis.

Patients and Methods: The prospective study was carried out in 350 patients with upper urinary tract obstruction. They were inspected by urinary bacterial culture, cystoscopy and ureteroscopy. Results: In 350 cases of upper urinary tract obstruction, 75 (21.45%) cases were accompanied with visible chronic cystitis. Fifty-one (20.08%) cases were accompanied with chronic cystitis in 254 cases of upper urinary tract obstruction induced by renal and ureteral stone, and 24 (25.00%) cases were accompanied with chronic cystitis in 96 cases by other factors (p > 0.05). Fifty-eight of 350 (16.57%) cases were chronic nonbacterial cystitis in 75 cases of chronic cystitis. Among them, 38 (10.86%) cases were cystitis glandularis, 11 (3.14%) cases were vesical leukoplakia and 9 (2.57%) cases were chronic hyperplastic cystitis. Six (10.34%) cases were positive urine culture in 58 cases of accompanied chronic nonbacterial cystitis in upper urinary tract obstruction, and 27 (9.82%) cases were positive urine culture in 275 cases without cystitis, as compared between 2 groups (p > 0.05). Following up to 16 cases of accompanied chronic nonbacterial cystitis in upper urinary tract obstruction, the clinic symptom and suspicious inflammation foci on the bladder in 10 cases was disappeared, but that in 6 cases remained visible and needed further management. Conclusion: It is suggested that there would be an association of upper urinary tract obstruction with the accompanied chronic cystitis, and long-term upper urinary tract obstruction could induce chronic nonbacterial cystitis. The pathogenesis should be further studied.
Patients. Patient age was 20–84 years, with a mean age of 49 years. Among them, 213 cases were male and other 137 cases were female. Etiological factor to upper urinary tract obstruction was renal or ureteral stones in 254 (72.57%) cases, pure ureteral stricture in 90 (25.71%) cases and ureteral polyp in 6 (1.71%) cases. A total of 337 (96.29%) cases were unilateral ureteral obstruction and 13 (3.7%) cases were bilateral.

Examination and Treatment Methods

On 350 cases, ureteroscopy was performed under spinal anesthesia; urinary bacterial culture and cystoscopy were routinely performed before the ureteroscopy. Urinary bacterial culture was considered as the positive urine culture when colony count was more than 100,000/ml. Ureteroscopy was performed to observe and diagnose the etiological factor to upper urinary tract obstruction and it would be further managed simultaneously as possible. In the above procedures, the emphasis was to inspect suspicious inflammatory lesion on bladder. To the patients with visible inflammatory lesion on bladder mucosa, pathological diagnosis was further made on the suspicious focus by biopsy. The bladder inflammatory lesion would be treated according to pathologic diagnosis later. Cystitis glandularis and vesical leukoplakia were routinely managed by transurethral electrovaporization on bladder lesion. Follow-up was performed to 16 cases of nonbacterial cystitis, their bladder lesion was not managed immediately as above but cystoscopy was performed in 3 month postoperatively.

Statistical Analysis

The differences between 2 analyzed data were compared using the $\chi^2$ test. Difference was considered significant at a p value < 0.05.

Results

In 350 cases of upper urinary tract obstruction, accompanied visible inflammation on bladder mucosa was found by cystoscopy in 75 cases (21.45%). Under cystoscope, the inflammatory lesions on bladder were symmetrically distributed, mainly located at trigone or neck of bladder, few cases were involved at the ureteric orifice and other region was rarely invaded.

<table>
<thead>
<tr>
<th>Case</th>
<th>Nonbacterial cystitis</th>
<th>Bacterial cystitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal or ureteral stone</td>
<td>51</td>
<td>39 (76.47%)</td>
</tr>
<tr>
<td>Other factors</td>
<td>24</td>
<td>19 (79.17%)</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>58 (77.33%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystitis glandularis</td>
<td>38</td>
</tr>
<tr>
<td>Vesical leukoplakia</td>
<td>11</td>
</tr>
<tr>
<td>Hyperplastic cystitis</td>
<td>9</td>
</tr>
<tr>
<td>Bacterial cystitis</td>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cases</th>
<th>Positive culture</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without cystitis</td>
<td>275</td>
<td>27</td>
</tr>
<tr>
<td>Cystitis glandularis</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Vesical leukoplakia</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Hyperplastic cystitis</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>

Fifty-one (20.08%) cases were accompanied with chronic cystitis in 254 cases of upper urinary tract obstruction induced by renal and ureteral stone, and 24 (25.00%) cases were accompanied with chronic cystitis in 96 cases by other factors, as compared between 2 groups (p > 0.05) (table 1).

Fifty-eight cases were diagnosed as chronic nonbacterial cystitis by pathologic examination in 75 cases of chronic cystitis and the incidence was 16.57% (58/350). Other 17 (4.86%) cases were chronic bacterial cystitis (table 2). There was statistically significant difference between 2 groups (p < 0.001).

Six (10.34%) cases were positive urine culture in 58 cases of accompanied chronic nonbacterial cystitis in upper urinary tract obstruction. And 27 (9.82%) cases were positive urine culture in 275 cases without cystitis (table 3). There was no statistically significant difference, as compared between 2 groups (p > 0.05).

Follow-up of 16 cases with accompanied chronic nonbacterial cystitis in upper urinary tract obstruction was obtained; average time was 6 months (range from 3months to 3 years). Among them, the clinic symptom and suspicious inflammation foci on the bladder was disappeared in 6 cases of cystitis glandularis, 2 cases of vesical leukoplakia and 2 cases of hyperplastic cystitis. However, the inflammation lesion in bladder mucosa remained visible in 3 cases of cystitis glandularis and 1
dularis and vesical leukoplakia are generally considered ureteral stone induces urinary cancer [2, 3]. Cystitis glan
dular, to the patients with upper urinary tract obstruction,
chronic cystitis induces upper urinary tract obstruction
renal or ureteral stone [1].

It is a fact that long-term lower urinary tract obstruction can induce chronic cystitis; unfortunately few papers have paid attention to discuss the relationship between upper urinary tract obstruction and the accompanied chronic cystitis. In upper urinary tract obstruction, urine flow is reduced at the far end of ureter from obstructive position, meanwhile, urine is lasting remained at the near end and renal pelvis, which could make it easier that urine component is deposited at local position, then crystallize and form stone, which could further reinforce the urinary tract obstruction. As a result, urine component and physiological circumstance in the bladder could be altered; it would finally result in bladder inflammation.

We found that the incidence of chronic cystitis in patients with upper urinary tract obstruction was 21.45%, which significantly higher than that in normal population. The incidence of accompanied chronic cystitis in patients between with renal or ureteral stone and without stone was no significant difference. Chronic nonbacterial cystitis such as cystitis glandularis, vesical leukoplakia, and hyperplastic cystitis was more common in the accompanied chronic cystitis. It is suggested that there would be an association of upper urinary tract obstruction with the accompanied chronic cystitis, and long-term upper urinary tract obstruction could induce chronic cystitis.

Chow et al. [2] found that individuals hospitalized for renal or ureteral stones are at increased risk of developing renal pelvis/ureter or bladder cancer, even beyond 10 years of follow-up. Chronic irritation and infection may play an important role in the course that renal and ureteral stone induces urinary cancer [2, 3]. Cystitis glandularis and vesical leukoplakia are generally considered as the disease with tendency to cancer. The etiology of cystitis glandularis and vesical leukoplakia is unclear until now; both cystitis glandularis and vesical leukoplakia are often accompanied with other inflammation and confused with chronic bacterial cystitis. Usually, cystitis glandularis and vesical leukoplakia should be managed by surgery for the tendency to cancer [3–7].

We also found that 38 cases of cystitis glandularis, 11 cases of vesical leukoplakia and 9 cases of hyperplastic cystitis in 350 cases of upper urinary tract obstruction and the incidence of chronic nonbacterial cystitis in upper urinary tract obstruction was 16.57%. This may be related to that long-term retention of urine and existence of renal or ureteral stone could result in urine composition changed in upper urinary tract obstruction, then bladder mucosa is stimulated by the urine with alternative physical and chemical properties. Furthermore, the paper showed that consequence of preoperative urinary bacterial culture was not statistically significant different between that with accompanied chronic nonbacterial cystitis and that without in upper urinary tract obstruction. It suggests that accompanied chronic nonbacterial cystitis in upper urinary tract obstruction is not the consequence directly induced by bacterial infection. The etiopathogenesis that upper urinary tract obstruction induces chronic nonbacterial cystitis should be further studied.

In the paper, follow-up to 16 cases of accompanied chronic nonbacterial cystitis in upper urinary tract obstruction was obtained. During follow-up period, the clinic symptom and suspicious inflammation focus on the bladder was disappeared in more cases that did not get any further management. When upper urinary obstruction is removed, the factor to cystitis will be clean away and the inflammation lesion on bladder mucosa could be naturally healed. It further suggests that the association of the accompanied chronic cystitis with upper urinary tract obstruction. However, the inflammation lesion in bladder mucosa remained visible in 3 cases of cystitis glandularis, 1 cases of vesical leukoplakia and 2 cases of chronic hyperplastic cystitis, which needed further management. Therefore, whether we take subsequent active treatment or attentive follow-up to the accompanied chronic nonbacterial cystitis remains a question.

Upper urinary obstruction caused by various factors could induce chronic non-bacterial cystitis such as cystitis glandularis, vesical leukoplakia and hyperplastic cystitis. The pathogenesis should be further studied. In clinical, to the patients with upper urinary tract obstruction, we should pay more attention to the accompanied chronic cystitis. The mucosa on trigone of bladder should be
routinely inspected by cystoscopy to upper urinary tract obstruction. To the patients with visible inflammation lesion in bladder mucosa, biopsy should be always taken for definite diagnosis. The therapeutic protocol to accompanied chronic nonbacterial cystitis in upper urinary tract obstruction should be further discussed.

Acknowledgement

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References


