#131 Bladder outlet obstruction significantly correlates with detrusor overactivity in patients with benign prostatic hyperplasia

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ABSTRACT

Bladder outlet obstruction (DO) is often associated with detrusor overactivity with impaired contraction (DHIC). However, the relationships between DO and DHIC overactivity remain controversial.

Aims of study
We often experience the detrusor overactivity with impaired contraction (DHIC) in male patients without obvious neurogenic diseases in video urodynamic studies. The aim of study is to investigate the relationships between bladder outlet obstruction and detrusor overactivity (DO) by comparing urodynamic findings between the patients with DO and patients without DO.

METHODS
We retrospectively reviewed medical records of male patients with benign prostatic hyperplasia who underwent urodynamic studies (UDS) between 2001 and 2016 in our institute. We divided the patients into 2 groups by the existence of DO in the UDS and evaluated urodynamic parameters in each groups. We also divided the patients by the degree of obstruction (ICS nomogram) and projected isovolumetric pressure.

RESULTS
487 patients who underwent UDS were investigated in this study. Mean age was 72.0±7.2 years, (median 72.0 years). 211 of them (43.3%) showed DO, and mean ages in DO group and non-DO group were not significantly different (72.0 years and 71.6 years, respectively). Mean maximum cystometric capacity and mean bladder compliance were significantly lower in DO group than in non-DO group (P=0.001, respectively) (Table 1). Furthermore, detrusor pressure at maximum flow was significantly higher in DO group than in non-DO groups (P=0.0007, Table 1). When all participants were divided into 3 groups by ICS nomograms (unobstructed, equivocal, and obstructed), the incidence of DO significantly correlated with the bladder outlet obstruction, whereas mean ages were not significantly different among 3 groups. The incidence of DO also significantly correlated with projected isovolumetric pressure.

Interpretation of results
Bladder function during filling was impaired in patients with DO as expected. Interestingly, detrusor contraction during voiding is significantly higher in patients with DO regardless of age. These data indicates that the age deterioration of patients with DO and bladder outlet obstruction is not associated with pathophysiology of DHIC.

Concluding message:
Bladder outlet obstruction in male patients correlates with the incidence of detrusor overactivity regardless of age. The pathophysiology of DHIC is further complex and further studies are needed to clarify this point.

STUDY PARTICIPANTS
487 patients were enrolled in this study. Of them 211 patients (43.3%) showed DO during bladder filling. Mean age is not significantly different between DO group and non-DO group. DO (+): 71.6± 7.5 yrs. DO (-): 71.6± 6.9 yrs.

Urodynamic Data during bladder filling
<table>
<thead>
<tr>
<th></th>
<th>DO (+)</th>
<th>DO (-)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDV (ml)</td>
<td>185.2± 74.0</td>
<td>207.5± 80.5</td>
<td>&lt;0.0048</td>
</tr>
<tr>
<td>MDV (ml)</td>
<td>280.6±101.8</td>
<td>320.4±92.8</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>BL compliance (ml/cmH2O)</td>
<td>32.8±24.4</td>
<td>50.9±45.8</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>UUI (%)</td>
<td>36.6</td>
<td>0.4</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Patients with DO showed significant decrease in FDV, MDV and bladder compliance. The group also showed the significant increase in the incidence of UUI.

Urodynamic Data during voiding
<table>
<thead>
<tr>
<th></th>
<th>DO (+)</th>
<th>DO (-)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voided volume (ml)</td>
<td>120.5± 72.4</td>
<td>190.5± 109.7</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Qmax (ml/s)</td>
<td>7.4± 3.7</td>
<td>7.6± 4.3</td>
<td>0.8360</td>
</tr>
<tr>
<td>PdetQmax (cmH2O)</td>
<td>103.2±40.3</td>
<td>88.6±35.0</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Residual urine (ml)</td>
<td>106.9±104.8</td>
<td>155.9±136.7</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Patients with DO showed significant decrease in voided volume, residual urine and significant increase in PdetQmax.

RESULTS

Concluding message:
Bladder storage function is impaired in BPH patients with DO as expected. Interestingly, detrusor contraction during voiding is significantly higher in patients with DO regardless of age. These data indicates that the age deterioration of patients with DO and bladder outlet obstruction is not associated with pathophysiology of DHIC.

Concluding message:
Bladder outlet obstruction in male patients correlates with the incidence of detrusor overactivity regardless of age. The pathophysiology of DHIC is further complex and further studies are needed to clarify this point.

ACKNOWLEDGEMENT
This study did not receive any specific funding.

All authors declare that they have no conflicts of interest related to the study.

This study was approved by the Institutional Ethics Committee of Shinsyu University School of Medicine (authorization number: 4317).

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