

A COMBINATION OF INTRAVESICAL PROSTATIC PROTRUSION AND RESISTIVE INDEX IS USEFUL TO PREDICT BLADDER OUTLET OBSTRUCTION IN PATIENTS WITH LOWER URINARY TRACT SYMPTOMS SUGGESTIVE OF BENIGN PROSTATIC HYPERPLASIA

Hypothesis / aims of study

To examine which parameters obtained from transrectal ultrasonography are accurate predictors of urodynamically-confirmed bladder outlet obstruction in patients with lower urinary tract symptoms suggestive of benign prostatic hyperplasia.

Study design, materials and methods

We retrospectively analyzed the medical charts of 350 patients who were referred to our hospital with lower urinary tract symptoms suggestive of benign prostatic hyperplasia in spite of receiving α 1-blocker treatment between January 2009 and December 2014. Baseline parameters were international prostate symptom score, quality of life score, postvoid residual urine volume, prostatic specific antigen and data obtained from uroflowmetry and transrectal ultrasonography. Urodynamic studies were performed to determine bladder outlet obstruction. Statistical comparisons between patients with and without bladder outlet obstruction were performed using the unpaired *t*-test. The correlation of the bladder outlet obstruction index with other variables was evaluated by Spearman's rank correlation analysis. Chi-squared tests were used to assess independent variables between the intravesical prostatic protrusion and other variables. Receiver operator characteristic curves were generated to compare the accuracy of the different parameters and the area under the curve of each parameter was calculated.

Results

On urodynamic studies, 180 patients (51.4%) were positive for bladder outlet obstruction and 170 patients (48.6%) were negative. There were significant differences between the two groups in international prostate symptom score, quality of life score, total prostate volume, transition zone volume, transition zone index (= transition zone volume / total prostatic volume), intravesical prostatic protrusion, resistive index of the prostate capsular artery (= [peak systolic flow velocity – end-diastolic flow velocity]/ peak systolic flow velocity), maximum urinary flow rate and prostatic specific antigen; however, there was no significant difference in age or postvoid residual urine volume. Preceding alpha-adrenergic antagonist was naftopidil in 119 patients, silodosin in 116 patients, and tamsulosin in 115 patients. There were no significant differences among three groups in the bladder outlet obstruction index (naftopidil; 44.2, silodosin; 44.2, and tamsulosin; 47.3). Rank correlation analysis showed that the bladder outlet obstruction index positively correlated with intravesical prostatic protrusion ($r = 0.567$, $p < 0.0001$), total prostate volume ($r = 0.369$, $p < 0.0001$), transition zone volume ($r = 0.405$, $p < 0.0001$), transition zone index ($r = 0.392$, $p < 0.0001$), resistive index ($r = 0.348$, $p < 0.0001$) and prostatic specific antigen ($r = 0.232$, $p < 0.0001$). Chi-squared tests revealed that resistive index was the only significant independent variable with intravesical prostatic protrusion ($p = 0.014$).

Intravesical prostatic protrusion had the highest area under the curve of 0.790 among all variables, and its cut-off value was 10 mm. The positive predictive value of intravesical prostatic protrusion was 76.2%. In addition, the positive predictive value of the combined parameters intravesical prostatic protrusion and resistive index increased to 83.8%.

Interpretation of results

The present study demonstrated that intravesical prostatic protrusion might be the most useful parameter among them. Further, intravesical prostatic protrusion and resistive index is the only independent combination among them, and the combination of them increases positive predictive value of bladder outlet obstruction.

The limitation of this study is that the patients have been received alpha-adrenergic antagonist monotherapy before initial evaluation. The patients who needed further treatment were the objects of this study, and alpha-adrenergic antagonist might influence the improvement of maximum urinary flow rate and the reduction of resistive index. These backgrounds should be considered to interpret our results.

Concluding message

Intravesical prostatic protrusion and resistive index are useful parameters for predicting bladder outlet obstruction in patients with lower urinary tract symptoms suggestive of benign prostatic hyperplasia. In clinical situations, the combination of intravesical prostatic protrusion and resistive index on ultrasound can be diagnostic of bladder outlet obstruction.

Disclosures

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