

THE UTILITY OF URGE PERCEPTION INDEX (UPI) IN DIAGNOSIS OF SEVERITY AND THERAPEUTIC EFFECT ON OVERACTIVE BLADDER OR BLADDER HYPERSENSITIVITY

Hypothesis / aims of study

In analysis of a bladder diary with the patient's self-reported urinary perception grades, we developed a novel quantitative measure of bladder hypersensitivity, which we refer to as the urge perception index (UPI) (1). In this study, we evaluate the significance of the UPI in diagnosis of OAB or bladder hypersensitivity in clinical practice.

Study design, materials and methods

122 patients (female, n=68; male, n=54) in our clinic suffering from storage symptoms were asked to complete a bladder-diary with self-reported grading of urinary perception and the overactive bladder symptom score, OABSS. For the simultaneous analysis of both severity of symptom and bother related to OAB, the perception of bother specific to each OABSS was asked (OABSS-VAS). To assess the QOL related to OAB symptoms, the VAS measure about QOL was also asked (VAS-QOL). In the bladder diary, the grade of urinary perception was defined by a score from 1 to 5 as follows; 1=Sensation of bladder filling without desire to void (convenience void), 2=Desire to void (voiding can easily be delayed for more than 30 min), 3=Strong desire to void (voiding cannot be delayed for more than 15 min), 4=Urgent desire to void (voiding cannot be delayed for more than 5 min) and 5=Urge urinary incontinence episode. The grade of urinary perception at each void was recorded in the bladder diary. UPI was defined as a quotient of voided volume/urinary perception grade at each void. We defined the averages of UPIs in the 3-day bladder diary as average UPI (A-UPI). We analyzed the UPI-value and the score of OABSS between OAB and non OAB patients. Moreover, in 53 patients who received treatments for OAB, we longitudinally monitored the UPI-value and the score of OABSS before and after the treatment.

Fig.1 ROC analysis for UPI to predict OAB

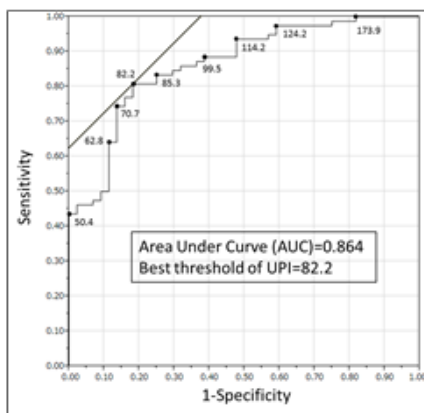
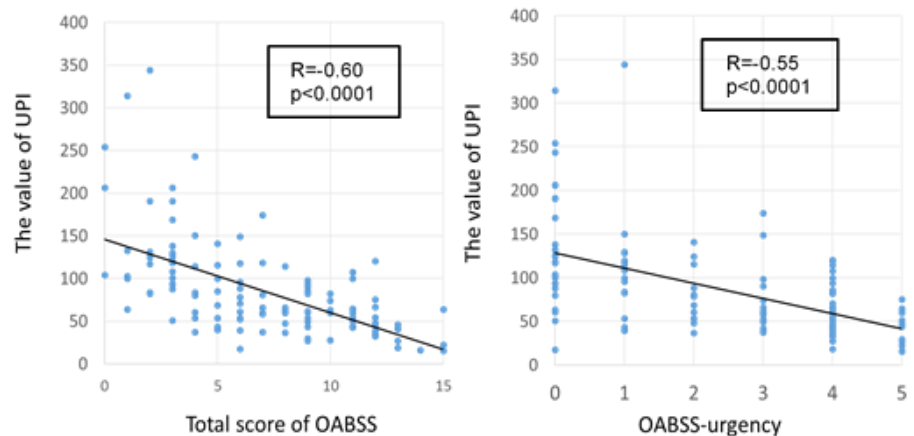


Fig.2 The correlation between the score of OABSS questionnaires and value of UPI



Results

[1] ROC (Receiver Operator Curves) analysis for UPI to predict OAB (Fig.1): In the analysis of 122 patients, ROC identified the best threshold UPI value of 82.2 for predicting OAB. Area under the curve (ARC) for UPI to predict OAB was 0.864. By concomitant use of the values of OABSS and UPI, the specificity was improved to 86.4%. **[2] The correlation between the score of OABSS questionnaires and value of UPI:** There were significant linear correlations of UPI with OABSS total score ($r=-0.60$, $p<0.0001$) and OABSS urgency score ($r=-0.55$, $p<0.0001$) (Fig.2). **[3] Monitoring the UPI-value and the score of OABSS before and after the treatment:** By the treatment, there were significant symptomatic improvements in each score of OABSS-Q2 (nocturia, $p=0.0011$), OABSS-Q3 (urgency, $p<0.0001$) and Q4 (incontinence, $p=0.0082$), respectively. We found also significant improvement in OABSS total scores (pre-treatment 8.81 vs. post-treatment 7.05, $p<0.0001$) and UPI value (pre-treatment 69.0 vs. post-treatment 81.9, $p=0.0257$), respectively. There were also significant improvement in QOL in each score of OABSS-VAS scores (OABSS-VASQ1 (daytime frequency, $p=0.0069$), OABSS-VASQ2 (nocturia, $p=0.0127$), OABSS-VASQ3 (urgency, $p=0.0064$), OABSS-VASQ4 (incontinence, $p=0.0047$)), respectively. We found VAS-QOL score also showed significant improvement (pre-treatment 78.0 vs. post-treatment 59.2, $p=0.0002$). In analysis of relation between UPI and clinical variables, there were significant linear correlations of Δ UPI value (post-treatment UPI value minus pre-treatment UPI value) with Δ OABSS total scores (post-treatment OABSS total scores minus pre-treatment OABSS total scores) ($r=0.31$, $p=0.0242$) and Δ symptom score of urgency (post-treatment symptom score of urgency minus pre-treatment symptom score of urgency) ($r=0.33$, $p=0.0183$). In addition, we found significant linear correlations of Δ VAS-QOL measure (post-treatment VAS-QOL measure minus pre-treatment VAS-QOL measure) with Δ OABSS total scores ($r=0.58$, $p<0.0001$), Δ symptom score of urgency ($r=0.63$, $p<0.0001$), and Δ UPI value ($r=-0.28$, $p=0.048$).

Interpretation of results

ROC analysis identified the best threshold UPI of 82.2 to distinguish OAB vs. non-OAB with diagnostic ability of AUC as 0.864. Overall response of UPI value to the OAB-treatment had significant correlations with the change of OABSS scores as well

as with QOL score. UPI could quantify bladder hypersensitivity and monitoring the treatment effect for OAB patients through analysis of a bladder diary with the patient's self-reported urinary perception grades.

Concluding message

The urge perception index, which is an integrated parameter of patient reported bladder perception and voided volume, could be promising tool to quantify the severity and therapeutic effectiveness of OAB or bladder hypersensitivity by self-reported bladder diary analysis.

References

1. J Urol 2013;189:1797

Disclosures

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