

URGE PERCEPTION INDEX: A NOVEL QUANTITATIVE DIAGNOSTIC TOOL OF BLADDER AFFERENT FUNCTION IN ANALYSIS OF BLADDER DIARY WITH SELF-REPORTED GRADING OF URINARY PERCEPTION

Hypothesis / aims of study

The bladder diary with urinary perception can be also helpful in the evaluation of overactive bladder (OAB). In our previous study bladder diaries including bladder perception grades were analyzed to assess OAB symptoms in community-dwelling women 40 years of age or older(1). Additionally, the incidence and voided volumes of convenience void, which describes voiding episodes without a desire to void for social reasons, were significantly related to existing urgency or OAB (2). We developed a quotient of voided volume divided by urinary perception grade, which we refer to as urge perception index (UPI) (3).

The aim of this study was to compare UPI between OAB and non-OAB women in community-dwelling women examined during a mass-screening program in Japan, in order to enhance quantitatively identifying severity of OAB in analysis of the bladder diary including urinary perception grades.

Study design, materials and methods

A total of 271 women (mean 60 years old, range 40 to 84) were asked to complete 3-day bladder diary with a grade of urinary perception on community-based study in Japan. The grade of urinary perception at each void was defined on scores 1-5 as follows: 1 = Sensation of bladder filling without desire to void (Convenience void), 2 = Desire to void, 3 = Strong desire to void, 4 = Urge desire to void without incontinence, and 5 = Urge incontinence episode. UPI was defined as a quotient of voided volume/urinary perception grade at each void.

Results

Of the 271 women, 42 (15.5%) had OAB symptoms, including 19 (7%) without urge incontinence (OAB-Dry), and 23(10%) with urge incontinence (OAB-Wet). Mean value of the UPI of the OAB group was significantly lower than that in non-OAB group (74.4 vs. 129.7, $p<0.0001$) (**Figure 1**). In receiver operator characteristics (ROC) curve analysis, cutoff value of 108 for the UPI revealed diagnostic accuracy of OAB with sensitivity of 92.5% and specificity of 63.8% (**Figure 2**).

We used linear regression analysis to assess the correlation between UPI and the parameters of bladder diary in the all of subjects. A significant statistical positive correlation was observed between UPI and both the average voided volume ($r=0.64$, $p<0.0001$) as well as the maximum voided volume ($r=0.42$, $p<0.0001$). A significant statistical negative correlation was observed between UPI and both the urgency episodes ($r=-0.37$, $p<0.0001$) as well as the urinary frequency ($r=-0.22$, $p=0.0002$). On the other hand, the UPI significantly decreased with age in all subjects ($r=-0.16$, $p=0.01$), while the average voided volume increased with age ($r=0.11$, $p=0.06$). In stepwise multiple regression analysis, the average voided volume ($F=142.4$, $p<0.0001$), the urgency episodes ($F=41.8$, $p<0.0001$), age ($F=28.1$, $p<0.0001$) and urinary frequency ($F=5.9$, $p=0.016$) were independently correlated with UPI, $R^2=0.55$.

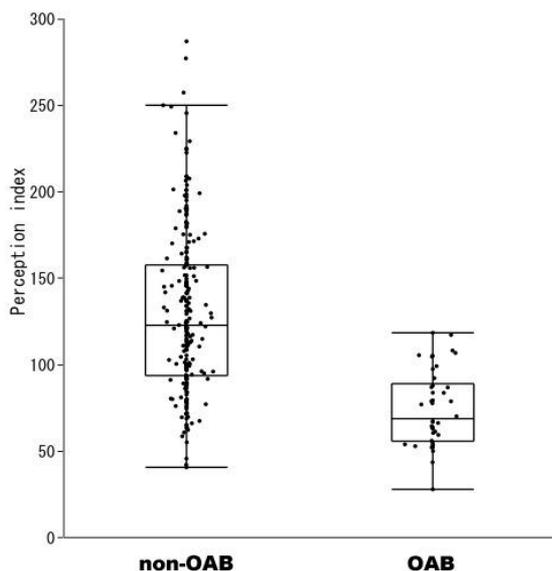


Figure 1

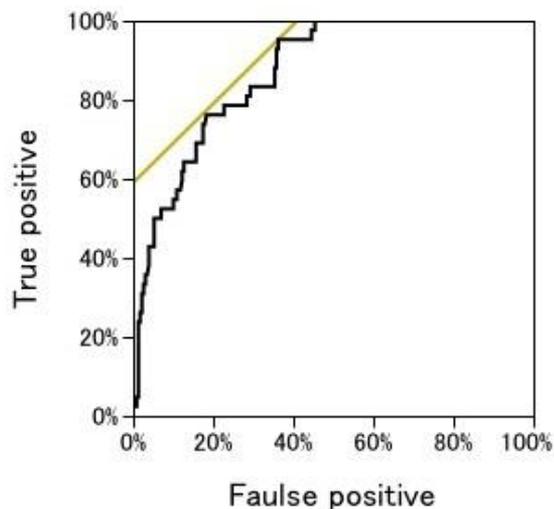


Figure 2

Interpretation of results

In the present study, we proposed a new index, urge perception index (UPI) which was a quotient of voided volume divided by urinary perception grade, in order to enhance quantitatively identifying severity of OAB in analysis of the bladder diary including urinary perception grades. The UPI of the OAB group was significantly lower than that in non-OAB group and cutoff value of 108 for the UPI revealed diagnostic accuracy of OAB with high sensitivity. Additionally, there were significant statistical positive correlations between UPI and both the average voided volume and the maximum voided volume, meanwhile, there were significant statistical negative correlations between UPI and both the urgency episodes and the urinary frequency. Thus, the UPI easily indicated the severity of OAB in the women. Bladder diary is considered to be an essential tool for diagnosis of OAB, and when we interpret the bladder diary with simultaneous analysis of both voided volume divided by urinary perception grade in each void, UPI could be a novel quantitative diagnostic tool of bladder afferent function.

Concluding message

The UPI could be useful in distinguishing OAB and non-OAB in quantitative analysis of bladder diary with patient's self-reported urinary perception grades.

References

1. Neurourol Urodyn, 28: 982, 2009.
2. Nerurourol Urodyn, 29:1286,2010.
3. EAU 2011, Abstract #918.

<i>Specify source of funding or grant</i>	None
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	The Ethical Committee of Meiji University of Integrative Medicine
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes