

## The Urgency Perception Score: Validation and Test-Retest

Jerry G. Blaivas,\* Georgia Panagopoulos, Jeffrey P. Weiss, Chandra Somaroo and David C. Chaikin

From the Weill Medical College of Cornell University (JGB, JPW, DCC), Lenox Hill Hospital (GP) and UroCenter of New York (CS), New York, New York

**Purpose:** We validate a grading system for urinary urgency.

**Materials and Methods:** A total of 225 subjects participated in a validation study of a fixed format question that examined the reasons why an individual usually voids. The response comprised 5 graded categories. The written questionnaire was completed by the subject twice in 3 to 14 days, during which there was no change in symptoms. Subjects included asymptomatic normal volunteers and consecutive patients with lower urinary tract symptoms without urinary urgency and those with overactive bladder with or without other lower urinary tract symptoms. Content validity was established by an expert panel. Discriminant validity was assessed by examining the frequency of responses in the various categories across the 3 groups (chi-square test) and by comparing average scores in each of the 3 groups using 1-way ANOVA, followed by LSD post hoc tests. Test-retest reliability was assessed using the intraclass correlation coefficient and  $\kappa$  coefficient.

**Results:** A total of 83 normal subjects, 62 patients with lower urinary tract symptoms and 80 patients with overactive bladder were included in the study. Median age was 71 years (range 21 to 97). For test-retest reliability the intraclass correlation coefficient (0.86) and  $\kappa$  coefficient (0.68) indicated a good level of agreement ( $p < 0.001$ ). The overactive bladder group achieved a significantly higher score than the normal and lower urinary tract symptoms groups (mean  $\pm$  SD  $2.5 \pm 0.99$  vs  $1.6 \pm 0.93$  and  $1.8 \pm 0.93$ , respectively, each  $p < 0.001$ ).

**Conclusions:** The urgency perception score appears to be a valid and reliable means of grading urinary urgency. We believe that this method of grading urgency will prove to be more clinically useful than the simple yes/no characterization of urgency as a sudden compelling desire to void and it will be a useful item for questionnaires and diary keeping.

*Key Words: bladder, urination disorders, questionnaires*

The ICS defines urgency as “a sudden compelling desire to void that is difficult to defer.”<sup>1</sup> As such, the term is an all or none phenomenon and is impossible to grade. In contrast, we believe that the urge or desire to void is a continuum, gradually increasing urges to void are a major cause of distress in patients and the term as defined by the ICS merely represents the most extreme degree of urgency. Furthermore, we believe that a compelling desire to void that is not sudden may be pathological and it certainly should be considered a symptom. Recently DeWachter and Wyndaele described and validated a scoring system based on the “grade of sensation of bladder fullness at each micturition according to predefined grades of sensation.”<sup>2</sup> We modified this slightly and term the grading system the UPS. We further validated the psychometric properties of the UPS by administering it to normal volunteers, patients with LUTS but no urgency and patients with OAB with or without other LUTS.

### METHODS

A total of 225 consecutive subjects were recruited to participate in an institutional review board approved validation

study of a new self-report 5 item OAB questionnaire (see Appendix). A fixed format question identical to that proposed by DeWachter and Wyndaele<sup>2</sup> examined the reasons why an individual usually voids. The responses to that question form the basis of this study (table 1). The written questionnaire was completed twice by the subject without assistance in 3 to 14 days, during which there was no change in symptoms.

Subjects were classified into 3 groups. Normal volunteers (normal group) were recruited from relatives of patients and office staff after confirmation that they did not have LUTS. Consecutive patients were categorized into 2 groups, that is patients with LUTS but not urgency (LUTS group) and patients with OAB with or without other LUTS (OAB group). Inclusion into each of these groups was based on the clinical diagnosis made by 1 of 3 senior investigators using initial patient interview data and a review of several written questionnaires, including the International Prostate Symptom Score and a generic patient questionnaire used in the office as part of the routine patient intake history. Except for the International Prostate Symptom Score no other questionnaire was a validated research instrument. Rather, they were tools to aid in history taking that were developed specifically for the practice of urology in general and LUTS in particular. Discrepancies in responses to relevant questions in the questionnaire were resolved by the interviewer, who explained the ICS definition of urgency to the patient.

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\* Correspondence: 445 East 77th St., New York, New York 10021 (telephone: 212-772-3900; FAX: 212-772-1919; e-mail: jblvs@aol.com).

TABLE 1. Cross-tabulation of degree of agreement between first and second questionnaire administration

| First  | Second |    |    |    |    | Total No. |
|--------|--------|----|----|----|----|-----------|
|        | 0      | 1  | 2  | 3  | 4  |           |
| 0      | 10     | 1  | 1  | 0  | 0  | 12        |
| 1      | 4      | 46 | 7  | 2  | 1  | 60        |
| 2      | 0      | 8  | 78 | 9  | 3  | 98        |
| 3      | 1      | 2  | 3  | 20 | 4  | 30        |
| 4      | 1      | 1  | 2  | 1  | 20 | 25        |
| Totals | 16     | 58 | 91 | 32 | 28 | 225       |

Content validity had been previously established<sup>2</sup> and it was reassessed by an expert panel, who concurred. Discriminant validity was assessed as 1) the frequency of responses in the various categories was tabulated across the 3 groups and analyzed using the chi-square test; and 2) average scores on the item in each of the 3 groups were calculated and compared using 1-way ANOVA and Fisher's LSD post hoc tests. Test-retest reliability was assessed using the intraclass correlation coefficient and  $\kappa$  coefficient of agreement. Demographic characteristics were compared using ANOVA for continuous data and the chi-square test for categorical data with  $p < 0.05$  considered a priori to indicate statistical significance.

## RESULTS

There were 83 normal subjects, 62 patients in the LUTS group and 80 patients in the OAB group. The 98 men (44%) and 127 women (56%) were 21 to 97 years old (median age 71). There was a significant difference in sex and age distributions across the 3 groups. There were more women than men in the OAB group (73% vs 27%,  $p = 0.001$ ), whereas men and women were equally distributed in the LUTS group (50% vs 50%) and in the normal group (46% vs 54%). The OAB group was significantly older than the normal and LUTS groups (mean  $\pm$  SD age  $71 \pm 14.3$  years vs  $64 \pm 15.6$  and  $65 \pm 15$ ,  $p < 0.01$  and  $< 0.05$ , respectively). There was no age difference between the LUTS and normal groups ( $p = 0.17$ ).

The intraclass correlation coefficient for question test-retest reliability was 0.86 and the  $\kappa$  coefficient was 0.68, indicating good agreement ( $p < 0.001$ ). Table 1 shows the  $4 \times 4$  cross-tabulation of the degree of agreement between responses on the first and second administration of the questionnaire, on which the calculation of the  $\kappa$  coefficient was based.

We also calculated the  $\kappa$  coefficient in each of the 3 groups, and separately in male and female participants. It was observed to be highest in the LUTS group, followed by the normal group, and it was lowest in the OAB group

( $\kappa$  0.88, 0.72 and 0.45, respectively, each  $p < 0.01$ ). Although the observed degree of agreement was slightly higher in men than in women ( $\kappa$  0.74 and 0.64, respectively) each indicated significant pretest-posttest agreement in responses ( $p < 0.001$ ). No significant differences were observed between men and women in the frequency of their responses to the urgency question. The distribution of the frequency of response options was similar in men and women when analysis was performed in the total sample of participants (Pearson chi-square 5.6,  $p = 0.32$ ) as well as in the 3 subgroups LUTS, normal and OAB ( $p = 0.13$ , 0.46 and 0.06, respectively). Although there appeared to be a trend toward a sex influence in the OAB group since more women tended to endorse responses in the higher urgency spectrum, these results must be viewed with caution due to the small sample size of the resulting cells.

Discriminant validity was evaluated by examining responses in the 3 groups. Table 2 lists these responses. Since 3 table cells had fewer than 5 responses, it was not advisable to interpret the significant  $p$  value of the chi square test ( $p = 0.024$ ). Instead we present ANOVA result  $p$  values, which compared the mean scores in each group on this item. ANOVA comparing the normal and the 2 patient groups revealed that the OAB group achieved a higher mean score than the normal volunteers and the LUTS group ( $2.5 \pm 0.99$  vs  $1.6 \pm 0.94$  and  $1.8 \pm 0.93$ , each  $p = 0.001$ ). The difference in mean urgency grade scores between the normal and LUTS groups was not significant ( $p = 0.17$ ).

Furthermore, whereas 44% of patients with OAB usually voided with severe or precipitous urge (grades 3 and 4), only 12% of normal subjects did so. Conversely 47% of normal subjects normally voided with little or no urge (grades 0 to 1) compared to 11% of the OAB group.

## DISCUSSION

The results of this study suggest that the UPS, as modified from the bladder sensation scoring system described by deWachter and Wyndaele,<sup>2</sup> is a valid and reliable instrument for grading the urge to void and assessing the reason why individuals usually void. Content and discriminant validity were established and test-retest reliability was also demonstrated. It confirmed the results of deWachter and Wyndaele that approximately half of asymptomatic volunteers normally void due to convenience with little or no desire (grades 0 to 1).<sup>2</sup> However, it was interesting that only 44% of patients with OAB void with severe or desperate urge (grades 3 to 4) and 11% void with little or no urge. There are 2 likely but unproven explanations for this. 1) Patients with OAB may void more frequently before they experience urgency in a conscious or unconscious attempt to avoid urgency, incontinence or other urinary symptoms. 2) In most studies of

TABLE 2. Responses to urge perception question, "What is the reason you usually urinate?"

| Grade  | Definition                                       | No. Normal (%) | No. LUTS (%) | No. OAB (%) |
|--------|--|----------------|--------------|-------------|
| 0      | Convenience (no urge)                            | 8 (10)         | 2 (3)        | 2 (2)       |
| 1      | Mild urge (can hold greater than 1 hr)           | 31 (37)        | 22 (36)      | 7 (9)       |
| 2      | Moderate urge (can hold greater than 10-60 mins) | 34 (41)        | 28 (45)      | 36 (45)     |
| 3      | Severe urge (can hold less than 10 mins)         | 6 (7)          | 5 (8)        | 19 (24)     |
| 4      | Desperate urge (must go immediately)             | 4 (5)          | 5 (8)        | 16 (20)     |
| Totals |  | 83             | 62           | 80          |

OAB average urinary frequency is about 11 voids daily but only 2 to 3 voids are urgency voids.

The UPS implies that the sensations that lead to micturition are a continuum and after the urge to void is felt, if one waits too long, he or she will experience the same sensation (except for the sudden onset) that is perceived as urgency according to the ICS definition. Some experts contend that urgency is a completely different sensation than the strong urge to void experienced when one simply waits too long after the desire to void is felt and there is no such continuum. Chapple et al specifically stated that “it is important to differentiate between ‘urge’ which is a normal physiological sensation and urgency which we consider pathological. Central to this distinction is the debate over whether urgency is merely an extreme form of ‘urge.’ If this was a continuum, then normal people could experience urgency but in the model we propose, urgency is always abnormal.”<sup>3</sup> However, this distinction between urge and urgency is based on the expert opinion of these investigators and not on peer reviewed data.

Currently we are aware of the urgency severity score as the only validated instrument that is designed to grade urgency.<sup>4,5</sup> The USS grades urgency per toilet void as none, mild, moderate or severe. By implication it supports our contention that the sensations describing the urge to void are a continuum. Finally, even the ICS document states that urgency may be graded. In the discussion of the bladder diary it states that “Bladder diary ... records the times of micturitions and voided volumes ... and other information such ... the degree of urgency.”<sup>1</sup>

We believe that the current UPS will prove to be more clinically useful than the simple yes/no ICS definition of urgency as a sudden compelling desire to void whether or not urgency is on a continuum with the normal desire to void. For example, if an individual experiences the gradual onset of a strong desire to void during the course of 1 hour after the last micturition and the volume of urine in the bladder is 60 ml, we suspect that all experts would agree that the sensation is pathological and it should be considered a severe symptom. However, it does not conform to the current definition of urgency.

There are a number of limitations to this study. 1) Since as our patients were English speaking and all were referred to a urologist because of persistent LUTS, the results may not be applicable to other patient populations. 2) Patients were assigned to the OAB or LUTS group based on the diagnosis attributable to them by the urologist to whom the patient was referred. This introduced an element of subjectivity and, thus, the possibility of bias. 3) Men and women were included in the study. It is possible that the 2 sexes have different causes of urgency and might perceive urgency differently. However, in our study we did not obtain enough evidence to conclude that such differences exist. 4) The 3 groups were not comparable with respect to age and sex. The OAB group was older and it included more women than men. 5) The UPS asks the patient why he or she usually voids and not how often he or she experiences urgency, or how severe or bothersome it is. Furthermore, patients with OAB may consciously void before they experience an urge to prevent symptoms. For these 2 reasons the UPS cannot be used as an independent index of severity. Rather, it must be combined

with complementary measures of OAB symptoms. However, currently there is only 1 such published instrument, which is the urgency severity score described.

The UPS has several potential applications. 1) It can become an important component of an OAB symptom severity and outcome score, such as the one that we are currently developing. 2) As suggested by deWachter and Wyndaele,<sup>2</sup> it can be a useful component of a bladder diary, describing the severity of the sensation perceived before each void.<sup>3,4</sup> In this regard one could consider the number of urgency voids as being those described as grade 3 or 4 and convenience voids as those described as 0 and 1. If used as an outcome tool, one could define improvement as a decrease in the grade of the usual reason for micturition, in the number of urgency voids or in UPS grade.<sup>1,5</sup>

**APPENDIX**

|   |             |
|---|-------------|
| NAME: _____   | DATE: _____ |
| <p>1. What is the reason that you usually urinate?</p> <ul style="list-style-type: none"> <li>– Out of convenience (no urge)</li> <li>– Because I have a mild urge (but can delay urination for over an hour if I have to)</li> <li>– Because I have a moderate urge (but can delay urination for more than 10 but less than 60 minutes if I have to)</li> <li>– Because I have a severe urge (but can delay urination for less than 10 minutes)</li> <li>– Because I have desperate urge (must stop what I am doing and go immediately)</li> </ul> |             |
| <p>2. Once you get the urge to urinate, how long can you usually postpone it comfortably?</p> <ul style="list-style-type: none"> <li>– More than 60 minutes</li> <li>– About 30–60 minutes</li> <li>– About 10–30 minutes</li> <li>– A few minutes (less than 10 minutes)</li> <li>– Must go immediately</li> </ul>   |             |
| <p>3. How often do you get a sudden urge to urinate that makes you want to stop what you are doing and rush to the bathroom?</p> <ul style="list-style-type: none"> <li>– Never</li> <li>– Rarely</li> <li>– A few times a month</li> <li>– A few times a week</li> <li>– Daily</li> </ul>  |             |
| <p>4. How often do you get a sudden urge to urinate that makes you want to stop what you are doing and rush to the bathroom but you don't get there in time (eg, you leak urine or wet pads)?</p> <ul style="list-style-type: none"> <li>– Never</li> <li>– Rarely</li> <li>– A few times a month</li> <li>– A few times a week</li> <li>– Daily</li> </ul>   |             |
| <p>5. In your opinion how good is your bladder control?</p> <p style="text-align: center;">0 1 2 3 4 5 6 7 8 9 10</p> <p style="text-align: center;">perfect control    good control    no control at all</p>   |             |

| <b>Abbreviations and Acronyms</b> |                                    |
|-----------------------------------|------------------------------------|
| ICS                               | = International Continence Society |
| LUTS                              | = lower urinary tract symptoms     |
| OAB                               | = overactive bladder               |
| UPS                               | = urgency perception score         |

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