



## Original Article

# Strong Correlation Between the Overactive Bladder Symptom Score and Urgency Severity Score in Assessment of Patients With Overactive Bladder Syndrome

Qian-Sheng Ke, Hann-Chorng Kuo\*

Department of Urology, Buddhist Tzu Chi General Hospital and Tzu Chi University, Hualien, Taiwan

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## Abstract

**Objective:** To correlate between the overactive bladder symptom score (OABSS) and urgency severity score (USS) in a group of patients with overactive bladder (OAB) syndrome and evaluate the changes in these two measures after antimuscarinic treatment.

**Materials and Methods:** A total of 170 patients with clinical symptoms of frequency urgency were prospectively enrolled in this study. The Chinese version of the OABSS questionnaire, which has been linguistically validated, and the USS based on a 3-day voiding diary were recorded at baseline. Patients with clinically diagnosed OAB were treated with solifenacin 5 mg daily for 1 month, and the OABSS and USS were repeated at 1 week and 1 month. The OABSS and USS were compared at baseline, 1 week and 1 month after treatment.

**Results:** The patients enrolled included 98 men and 72 women with a mean age of 64.1 years. A high OABSS total score was significantly associated with a high grade of USS. There was a significant correlation between the two scores ( $R^2=0.5520$ ,  $p<0.0001$ ). The main contributions to the OABSS in patients with a low USS were daytime frequency and nighttime frequency. The contribution of urgency and urgency urinary incontinence became significant in patients with high urgency grades. The changes in the USS and OABSS were significant at 1 month. The change in frequency was significant in the daytime as well as at nighttime.

**Conclusion:** A strong correlation between the OABSS and USS based on a voiding diary was noted in patients with OAB. The changes in these two measures were similar after solifenacin treatment. (*Tzu Chi Med J* 2010; 22(2):82–86)

\*Corresponding author. Department of Urology, Buddhist Tzu Chi General Hospital, 707, Section 3, Chung-Yang Road, Hualien, Taiwan.  
E-mail address: hck@tzuchi.com.tw

## 1. Introduction

Overactive bladder (OAB) is a common complaint in the elderly. Previous epidemiological studies have

revealed that 10–15% of the population suffer from various degrees of OAB (1). Urgency is the core symptom of OAB. According to recommendations on lower urinary tract symptoms by the International

Continence Society, increased bladder sensation (IBS) is defined as a sensory symptom with a sensation of desire to void which occurs early during bladder filling, while urgency is defined as a bladder storage symptom with a sudden, compelling desire to pass urine which is difficult to defer (2). The difference between these two symptoms is that micturition can be postponed despite the desire to void in IBS, but not in urgency. It is possible that patients with lower urinary tract symptoms may not be able to differentiate between IBS and OAB and may report IBS as OAB.

Assessment of OAB severity is not an easy task. There have been several validated symptom scores developed for clinical use and research purposes. The overactive bladder symptom score (OABSS) is a recently designed tool to evaluate patients with OAB symptoms and is popular in the Asia-Pacific region (3). It contains four domains dealing with daytime frequency, nighttime frequency (nocturia), urgency and urgency urinary incontinence (UUI) episodes with a score from 0 to 15. A total OABSS score=5 indicates OAB syndrome. This score also implies that patients with severe frequency (score=2) and nocturia (score=3) but no urgency can also have OAB. A strong correlation of bladder hypersensitivity with OAB has been postulated (4).

The Indevus Urgency Severity Score (IUSS) has also been proposed and validated. The IUSS is a simple questionnaire for patients to report the severity of urgency (5). Patients might have urgency but no frequency because they modulate their drinking habits to cope with bothersome OAB symptoms. Since the core symptom of OAB is urgency, the severity of urgency might be used to assess the clinical condition as well as treatment outcome.

This study prospectively measured the OABSS and USS in a group of patients with OAB syndrome and evaluated the changes in these two measures after antimuscarinic treatment.

## 2. Materials and methods

A total of 170 patients with clinical symptoms of frequency urgency were prospectively enrolled in this study. Patients were requested to fill out the Chinese version of the OABSS questionnaire (Table 1), which has been linguistically validated. All patients were also requested to record a 3-day voiding diary and the urgency severity score (USS) according to their perception of urgency severity at each urgency episode. The most frequently occurring USS was obtained as the overall USS. The OABSS was scored according to the recommendations of Homma et al (3). The USS was adapted from the IUSS and modified by adding a score of 4 for an episode when a patient was unable to hold urine, leaked urine, or had a wetting accident

before getting to the bathroom (Table 2). The total OABSS score, OABSS subscores, and USS in the voiding diary were correlated at baseline.

Patients with clinically diagnosed OAB were treated with solifenacin 5 mg daily for 1 month, and the OABSS and USS were repeated at 1 week and 1 month. The OABSS and USS were compared at baseline, 1 week and 1 month.

Pearson's correlation was used to correlate the OABSS and USS and the paired *t* test was used to compare the changes in the OABSS and USS at baseline and after treatment. A *p* value <0.05 was considered statistically significant.

## 3. Results

The patients enrolled included 98 men and 72 women with a mean age of 64.1 years old. Patients with a USS of 0 were significantly younger than those with a USS=1 ( $p<0.05$ ). The mean OABSS by USS grade is shown in Table 3. A high OABSS total score was associated with a high USS.

Fig. 1 shows the correlation between the USS grade and OABSS total score. There was a significant correlation between the two scores ( $R^2=0.5520$ ,  $p<0.0001$ ). Although most patients with a USS of 0 had an OABSS <5, patients with OABSS <5 had various grades of USS. However, USS and OABSS for all patients were highly correlated.

Table 4 shows the contributions of the four components of the OABSS with different USS. Patients with USS of 0 and USS of 1 had minimal scores for urgency and UUI on the OABSS. The main contributions to the OABSS in patients with low USS were daytime frequency and nighttime frequency. The contribution of urgency and UUI became significant in patients with high urgency grades.

The changes in USS and OABSS after solifenacin treatment are listed in Table 5. A total of 51 patients completed the trial and recordings. The changes in USS and OABSS were not significant at 1 week, but were significant at 1 month. The change in frequency was significant in the daytime as well as at nighttime. The changes in these parameters over time were also highly correlated between the USS and OABSS ( $p<0.01$ ).

## 4. Discussion

OAB has become an important urological syndrome with great impact on quality of life and emotions. Although there are several scoring systems and questionnaires that assess the severity of OAB and its impact on quality of life, no single urological index yields a quantifiable and clinically interpretable measure of

**Table 1 — Chinese version of the overactive bladder symptom score (OABSS)**

膀胱過動症症狀問卷 (Overactive Bladder Symptom Score; OABSS)

以下症狀大約的出現頻率為何？請選出一個與最近一週內您的狀態最接近的選項，並在分數的數字上打圈。

問題	症狀	分數	頻率
1	您早上起床後到睡前為止，大約要小便幾次？	0	7次以下
		1	8-14次
		2	15次以上
2	您晚上就寢後到早上起床為止，大約要醒來小便幾次？	0	0次
		1	1次
		2	2次
		3	3次以上
3	您多常有突然想小便，此種感覺難以延遲 (難以憋住)？	0	無
		1	每週少於 1 次
		2	每週 1 次以上
		3	每天 1 次左右
		4	每天 2-4 次
		5	每天 5 次以上
4	您多常有因尿急難以延遲 (難以憋住) 而漏尿？	0	無
		1	每週少於 1 次
		2	每週 1 次以上
		3	每天 1 次左右
		4	每天 2-4 次
		5	每天 5 次以上
	合計分數	分	

註 1 若問卷內容及回答選項大致相同，不採用本形式亦無妨。

註 2 本表將對象期間設定為「最近 1 週內」，但隨使用狀況不同，亦可變更為例如「最近 3 天內」或「最近一個月內」。無論如何，必須限定特定期間。

**Table 2 — Definition of the urgency severity score**

0	No feeling of urgency: patient can continue activities until he (she) chooses to use the bathroom.
1	Mild feeling of urgency: patient can feel the need to urinate but it is easily tolerated. He (she) can finish the activity or task before going to the bathroom.
2	Moderate feeling of urgency: sensation of urgency causes discomfort. He (she) needs to stop the activity or task to go to the bathroom.
3	Severe feeling of urgency: sensation of urgency causes much discomfort. He (she) has difficulty holding urine. He (she) must stop the activity or task to hurry to the bathroom to avoid a wetting accident.
4	Unable to hold and leaks urine: patient has a wetting accident before getting to the bathroom.

OAB symptoms. Most OAB scoring systems, such as the International Consultation of Incontinence questionnaire (ICI-Q), OABSS, and Urogenital Distress Inventory short form (UDI-6), measure the frequency

or urgency and frequency episodes during a given period, but the severity of urgency is not assessed as a quantitative measure reflecting real life conditions. A composite symptom score of toilet voids, urgency severity, and urge urinary incontinence has been developed to better indicate the urgency severity for each toilet void (6).

Among OAB symptoms, urgency is the most difficult to measure. Most patients with OAB modify their behavior to prevent urgency or UUI. Therefore, they might report a low OAB score. Since urgency is the cornerstone of OAB, it is essential to incorporate urgency severity into the scoring system to assess the therapeutic effectiveness of different treatment regimens.

The OABSS comprises four symptoms: daytime frequency, nighttime frequency, urgency and UUI. The weighing score was based on a secondary analysis of an epidemiological database with maximal

scores of 2, 3, 5 and 5 for individual symptoms. The sum score was significantly greater in the patients with OAB than in the groups of patients with stress urinary incontinence, benign prostatic hyperplasia, and asymptomatic controls (3). The OABSS has been found to be closely correlated with patient perceptions of their bladder condition and OAB-q subscales

of health-related quality of life, indicating that the OABSS sufficiently reflects the severity of patient perceptions of urgency (7).

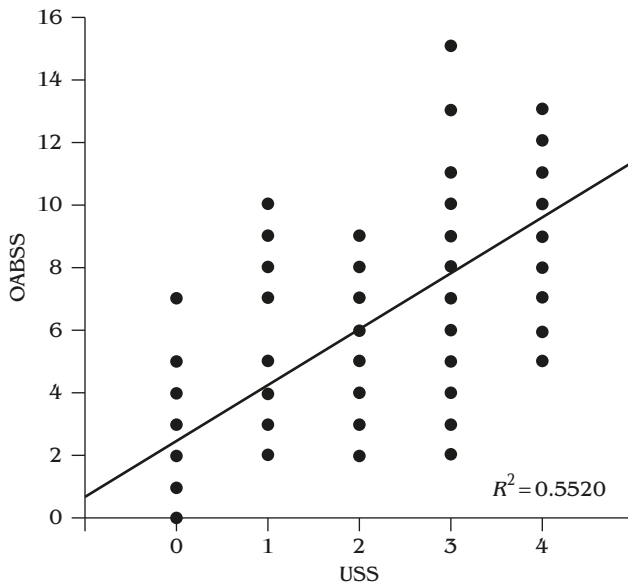
The results of this study further demonstrate that the OABSS can reflect the severity of urgency in real life in patients with OAB. Although a total of 170 patients with frequency urgency symptoms were prospectively enrolled, the USS was 0 in 42 and 1 in 24, indicating that a large proportion of patients did not have significant OAB symptoms impacting their daily life. The OABSS total score also reflected this condition with a mean score of 2.05 for a USS of 0 and 4.75 for a USS of 1. IBS without urgency has been considered a subgroup or an early form in OAB. If we choose a strict definition of OAB, patients with a USS of 0 on a voiding diary should not be included in the OAB group. This result further implicates the importance of a voiding diary in the differential diagnosis of OAB.

The results of this study showed that the higher the OABSS, the higher the USS grade. Analysis of the components of the OABSS for different USS also revealed that the main contributors to the OABSS in patients with a USS of 0 and a USS of 1 were frequency in the daytime and nighttime, and the contributions of urgency and the UII component were minimal for the low urgency grades. According to the construction of the OABSS, patients with only daytime frequency and nocturia but no urgency or UII may also be included in the OAB group, while patients

**Table 3 — Demographic characteristics of patients with different urgency severity scores (USS) and the corresponding overactive bladder symptom score (OABSS)\***

USS	N	Male	Female	Age (yr)	OABSS
0	42	13	29	45.9±19.7	2.05±1.43 (0-7)
1	24	18	6	61.8±16.8	4.75±2.47 (2-10)
2	29	16	13	71.4±8.9	6.31±2.24 (2-9)
3	43	24	19	70.5±13.3	7.79±2.70 (2-15)
4	32	27	5	74.4±11.6	9.13±2.67 (5-13)
Total	170	98	72	64.1±18.4	

\*Data presented as n or mean±standard deviation or mean±standard deviation (range).



**Fig. 1 — Correlation between overactive bladder symptom score (OABSS) and urgency severity score (USS).**

**Table 5 — Changes in urgency severity score (USS) and overactive bladder symptom score (OABSS) after antimuscarinic treatment\***

	Baseline (n=51)	1 wk (n=51)	1 mo (n=51)
USS	3.20±0.98	3.08±1.04	1.96±1.17 <sup>†</sup>
OABSS	7.70±2.76	7.58±2.87	5.90±3.14 <sup>†</sup>
Daytime frequency	9.52±2.77	7.10±2.83	6.48±2.61 <sup>†</sup>
Nighttime frequency	4.16±2.96	4.14±2.98	3.41±2.04 <sup>†</sup>

\*Data presented as mean±standard deviation; <sup>†</sup>p<0.05 compared to baseline data.

**Table 4 — Contribution of overactive bladder symptom score (OABSS) components for different urgency severity scores (USS)\***

USS (n)	Daytime frequency (0-2)	Nighttime frequency (0-3)	Urgency (0-5)	UII (0-5)	OABSS
0 (42)	0.87±0.56	1.20±1.03	0	0	2.05±1.43 (0-7)
1 (24)	1.25±1.35	2.15±1.59	1.35±1.43	0	4.75±2.47 (2-10)
2 (29)	1.15±1.12	2.05±1.05	2.50±1.0	0.65±0.41	6.31±2.24 (2-9)
3 (43)	1.37±1.23	2.15±1.57	3.15±1.29	1.12±1.05	7.79±2.70 (2-15)
4 (32)	1.25±1.43	2.21±1.05	4.07±2.01	1.65±1.43	9.13±2.67 (5-13)

\*Data presented as mean±standard deviation or mean±standard deviation (range).

with mild urgency without frequency and nocturia might also be excluded. This could be the cause for the wide distribution of the OABSS in patients with low USS in this study.

From the therapeutic results, we can observe a parallel decrease of the OABSS and USS at 1 month compared with baseline. Solifenacin has been demonstrated to be well tolerated and to significantly improve OAB symptoms compared with placebo (8). This study also confirmed that solifenacin has significant therapeutic effects not only in reduction of daytime and nighttime frequency, but also in the OABSS as well as urgency severity.

## 5. Conclusion

A strong correlation between the OABSS and USS based on a voiding diary was noted in patients with OAB and the changes in these two measures were similar after solifenacin treatment.

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