

Assessment of Overactive Bladder (OAB) — Symptom Scores

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Overactive bladder (OAB) is defined by the International Continence Society (ICS) as a complex of symptoms characterized by urinary urgency, with or without urge incontinence, usually with frequency and nocturia [1]. OAB greatly affects physical and social functioning, including work, sleep, sexual relationships and interpersonal relationships [2-4]. OAB, especially in patients with urge incontinence, eventually has a negative impact on health-related quality of life (HRQL). Because of the symptom frequency, OAB patients usually reduce water (fluid) intake and limit daily activity to avoid the discomfort [5].

Even though OAB is diagnosed by symptoms only, its assessment is very important for patients and physicians, especially for evaluation of treatment effectiveness. Multi-item questionnaires have been introduced to evaluate the impact of OAB and of treatment outcomes. For example, two different OAB symptom scores (OABSS) were developed by Homma et al and JG Blaivas et al and there are also the OAB questionnaire (OAB-q) and the King's Health Questionnaire (KHQ) that target quality of life [6-9]. One major concern for physicians who provide OAB treatment is the lack of a widely accepted questionnaire for OAB assessment. This makes communication between researchers difficult.

The questionnaires used for assessment of OAB are described below:

OAB symptom score (OABSS) developed by Y. Homma (2006)

This is a single symptom score that employs a self-report questionnaire to quantify OAB symptoms. The authors selected four symptoms -- daytime frequency, nighttime frequency, urgency, and urgency incontinence for the questionnaire (Appendix A) [6]. The overall score is the simple sum of the four symptom scores.

What is unusual about the Homma OABSS is the scoring. Traditionally, a questionnaire has many items with the same minimum and maximum score (i.e. the International Prostate Symptom score (IPSS) [10]. In contrast, with the OABSS, the scales vary. For instance, the item "How many times do you typically urinate from waking in the morning until sleeping at night?", the urgency score, ranges from 0-5. The score for "How often do you leak urine because you cannot defer the sudden desire to urinate?", urge incontinence score, also ranges from 0-5; However, "How many times do you typically wake up to urinate from sleeping at night until waking in the morning?", the nocturia

Appendix A OABSS (Homma et al)

TABLE I. Overactive bladder symptom score*

Question	Frequency	Score
How many times do you typically urinate from waking in the morning until sleeping at night?	≤ 7	0
	8-14	1
	≥ 15	2
How many times do you typically wake up to urinate from sleeping at night until waking in the morning?	0	0
	1	1
	2	2
	≥ 3	3
How often do you have a sudden desire to urinate, which is difficult to defer?	Not at all	0
	Less than once a week	1
	Once a week or more	2
	About once a day	3
	2-4 times a day	4
How often do you leak urine because you cannot defer the sudden desire to urinate?	5 times a day or more	5
	Not at all	0
	Less than once a week	1
	Once a week or more	2
	About once a day	3
	2-4 times a day	4
	5 times a day or more	5

* Patients were instructed to circle the score that best applied to their urinary condition during the past week; the overall score was the sum of the four scores.

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score, ranges from 0-3, while "How many times do you typically urinate from waking in the morning until sleeping", the frequency score, ranges from 0-2. Homma mentions that the relative weights across the four scores were determined on the basis of the maximal influence rate of that symptom in an epidemiological survey [11]. Since "urgency" is the "core symptom" of OAB, the design of the OABSS is aimed at showing a clear separation between those with OAB and controls.

One source of concern for the OABSS is that it was developed and validated using only Japanese patients. The authors did mention that cultural background may affect the psychometric properties of symptom questionnaires [6]. However, questionnaires originally developed for Western countries (International Prostate Symptom Score or Incontinence Impact Questionnaire [12]) are widely used in Taiwan.

In this context, the cultural differences between Japan and Taiwan would seem of less concern than similar differences between the East and the West.

OAB Symptoms Score (OABSS) developed by JG Blaivas (2007)

The OABSS was published in The Journal of Urology in 2007, a few months after publication of Homma's OABSS. Blaivas also used the acronym OABSS, but this assessment is entirely different. The authors mentioned that although there are many validated questionnaires for evaluation of lower urinary tract symptoms, there is no validated OAB symptom score that quantify all aspects of OAB and none that includes a graded response for urgency. The Blaivas OABSS quanti-

Appendix B OABSS (Blaivas et al)

OAB Questionnaire

NAME: _____ DATE: _____

1. How often do you usually urinate during the day ?
 - no more often than once in 4 hours
 - about every 3-4 hours
 - about every 2-3 hours
 - about every 1-2 hours
 - at least once an hour
2. How many times do you usually urinate at night (from the time you go to bed until the time you wake up for the day)?
 - 0-1 times
 - 2 times
 - 3 times
 - 4 times
 - 5 or more times
3. What is the reason that you usually urinate?
 - out of convenience (no urge or desire)
 - because I have a mild urge or desire (but can delay urination for over an hour if I have to)
 - because I have a moderate urge or desire (but can delay urination for more than 10 but less than 60 minutes if I have to)
 - because I have a severe urge or desire (but can delay urination for less than 10 minutes if I have to)
 - because I have desperate urge or desire (must stop what I am doing and go immediately)
4. Once you get the urge or desire to urinate, how long can you usually postpone it comfortably?
 - more than 60 minutes
 - about 30-60 minutes
 - about 10-30 minutes
 - a few minutes (less than 10 minutes)
 - must go immediately
5. How often do you get a sudden urge or desire to urinate that makes you want to stop what you are doing and rush to the bathroom?
 - never
 - rarely
 - a few times a month
 - a few times a week
 - at least once a day
6. How often do you get a sudden urge or desire to urinate that makes you want to stop what you are doing and rush to the bathroom but you do not get there in time (ie you leak urine or wet pads)?
 - never
 - rarely
 - a few times a month
 - a few times a week
 - at least once a day
7. In your opinion how good is your bladder control?
 - perfect control
 - very good
 - good
 - poor
 - no control at all

fies all aspects of OAB and includes a graded response for urgency [7].

The Blaivas OABSS is a self-administered questionnaire consisting of seven questions on a 5-point Likert scale. The questions relate to all symptoms of OAB, including one each for urinary frequency and nocturia, three for urgency, one for urge incontinence and one generic question concerning bladder control (Appendix B) [7]. The total score range is 0-28. The higher the score, the worse are the symptoms. In addition to the complete OABSS, there is an urgency subscale (questions #3-6) that can be used to grade the severity of urgency.

As mentioned before, urgency is the core symptom of OAB, but some investigators believe that urgency is an all-or-none phenomenon that cannot be graded [13]. Other studies have a different opinion and their results show that urgency is subjective, but can be graded [14-16]. The Blaivas OABSS includes not only the symptoms of OAB, but also a graded response for urgency.

The Blaivas OABSS omits an evaluation of HRQL. The authors explained that a number of validated instruments already exist for this. They also believed that, while they are important in their own right, QOL and other domains tend to dilute the efficacy parameters when combined into a single symptom score.

OAB-q. (2002)

OAB is a symptom-based condition without physiological markers of disease activity. HRQL is considered a key outcome in treatment evaluation [17]. Matza et al reviewed various HRQL questionnaires for urinary incontinence and OAB and demonstrated that the only instrument available for use with patients with OAB was the Overactive Bladder Questionnaire [18].

Coyne et al developed the OAB-q and this questionnaire is widely used for evaluation of OAB treatment outcomes. This questionnaire addresses "patient-reported outcomes" such as effect on the patient's life of symptoms and HRQL. The authors mentioned that although the KHQ and other instruments have been validated using a sample of incontinent OAB patients, the OAB-q is the first questionnaire that produces a continent and incontinent OAB-specific subjective patient-reported outcome measure [8].

The initial OAB-q consisted of 62 items (13 symptom questions, 4 general, and 44 HRQL) and was designed for self-administration. Symptom items addressed both the frequency and bother of frequency, urgency, nocturia and incontinence symptoms. HRQL items addressed coping behaviors, work, commuting and travel, sleep, physical activities, social activities, self-esteem/psychological well-being, relationships and sexual functioning [8]. Item reduction was done based on excluding items with high floor/ceiling responses, low item-to-total correlations or low factor loadings. The final OAB-q consists of an eight-item symptom bother scale and a 25-item HRQL scale [Appendix C].

According to Coyne's report, the OAB-q was able to detect differences between normal and OAB patients, indicating that continent OAB has a very real impact on HRQL, thus showing that OAB symptoms had an effect on psychological well-being and that worry/concern varied with OAB diagnosis. Patients with incontinent OAB reported more worry and concern than patients with continent OAB on the normal controls [8].

OAB-q is a widely accepted tool for measuring OAB-related symp-

toms and HRQL and is used in clinical management and treatment outcome evaluations. This instrument has been adopted by the International Consultation on Incontinence Questionnaire (ICIQ) committee as the questionnaire module for OAB (ICIQ-OAB). However, the disadvantage of OAB-q is obvious. It takes a long time for patients to complete the 33 items. Furthermore, patients may feel uncomfortable answering all the questions. This disadvantage limits the application of this questionnaire in clinical practice [19].

Patient Perception of Bladder Condition (PPBC) (2006)

Most questionnaires that evaluate the impact of OAB and treatment outcomes are multi-item, such as the OAB-q. The advantage of a multi-item questionnaire is that it is a rich source of information on the numerous domains of the patient's life, but this approach has the disadvantage that scoring and quick interpretation are difficult. Coyne et al developed a single, global question to assess the patient's overall perceived bladder condition [19]. A single-item global question is practical because of its brevity, its ease of use and its simplicity of interpretation [20].

Coyne's PPBC was developed for patients with urinary problems as a global assessment of bladder conditions and is recommended as a global outcome measure for urinary incontinence [21]. The PPBC is a single item that assesses the patient's subjective impression of current urinary problems (Appendix D). Patients are asked to rate their perceived bladder condition on a 6-point scale ranging from 1 (no problems at all) to 6 (many severe problems) (Appendix D). Score changes typically range from -2 to +2, with negative values indicating patient improvement. The PPBC has been demonstrated to be reliable using a small sample of patients with OAB.

According to Coyne's report, the PPBC was highly responsive to improvements in micturition frequency, urgency episodes, incontinent episodes, and patient-reported HRQL. The advantages of the PPBC are its simplicity and usefulness. However, the limitations of single-item global measures need to be well noted too. A single-item global measure cannot provide the depth or breadth of information that can be obtained from a multi-item measure. A treatment may have differential effects on the various symptoms that a patient has or on the different domains of the patient's HRQL; in these circumstances it is clear that a multi-item questionnaire would be more appropriate for determining these specific effects [19].

OABSS in Traditional Chinese (2008, Taiwan)

Even though the questionnaires described above are all widely available, they are all in English. Thus there was a need to translate and validate these questionnaires in Chinese so that they can be available for Taiwanese patients. Linguistic validation is the first step and a very important part of the cultural adaptation of a questionnaire. In 2006, Acquadro et al translated the OABq into fourteen languages [22]. The process included six steps: (1) two forward translations; (2) comparison and reconciliation of the translations; (3) back-translation; (4) comparison of the source and back-translation; (5) review by one urologist or gynecologist; and (6) a comprehension test, using patients. However, none of these versions was Traditional Chinese.

In 2008, the president of The Taiwan Continence Society (TCS), Professor Kuo, commenced linguistic validation and the other elements

Appendix C OAB-q

This questionnaire asks about how much you have been bothered by selected bladder symptoms during the past 4 weeks. Please circle the number that best describes the extent to which you were bothered by each symptom during the past 4 weeks. There are no right or wrong answers. Please be sure to answer every question.

During the past 4 weeks, how bothered were you by...	Not at all	A little bit	Some what	Quite a bit	A great deal	A very great deal
1. Frequent urination during the daytime hours	1	2	3	4	5	6
2. An uncomfortable urge to urinate	1	2	3	4	5	6
3. A sudden urge to urinate with little or no warning	1	2	3	4	5	6
4. Accidental loss of small amounts of urine	1	2	3	4	5	6
5. Nighttime urination	1	2	3	4	5	6
6. Waking up at night because you had to urinate	1	2	3	4	5	6
7. An uncontrollable urge to urinate	1	2	3	4	5	6
8. Urine loss associated with a strong desire to urinate	1	2	3	4	5	6

The above questions asked about your feelings about individual bladder symptoms. For the following questions, please think about your overall bladder symptoms in the past 4 weeks and how these symptoms have affected your life. Please answer each question about how often you have felt this way to the best of your ability. Please circle the number that best answers each question.

During the past 4 weeks, how often have your bladder symptoms...	None of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time
9. Made you carefully plan your commute?	1	2	3	4	5	6
10. Caused you to feel drowsy or sleepy during the day?	1	2	3	4	5	6
11. Caused you to plan 'escape routes' to restrooms in public places?	1	2	3	4	5	6
12. Caused you distress?	1	2	3	4	5	6
13. Frustrated you?	1	2	3	4	5	6
14. Made you feel like there is something wrong with you?	1	2	3	4	5	6
15. Interfered with your ability to get a good night's rest?	1	2	3	4	5	6
16. Caused you to decrease your physical activities (exercising, sports, etc.)?	1	2	3	4	5	6
17. Prevented you from feeling rested upon walking in the morning?	1	2	3	4	5	6
18. Frustrated your family and friends?	1	2	3	4	5	6
19. Caused you anxiety or worry?	1	2	3	4	5	6
20. Caused you to stay home more often than you would prefer?	1	2	3	4	5	6
21. Caused you to adjust your travel plans so that you are always near a restroom?	1	2	3	4	5	6
22. Made you avoid activities away from restrooms (i.e., walks, running, hiking)?	1	2	3	4	5	6
23. Made you frustrated or annoyed about the amount of time you spend in the restroom?	1	2	3	4	5	6
24. Awakened you during sleep?	1	2	3	4	5	6
25. Made you worry about odor or hygiene?	1	2	3	4	5	6
26. Made you uncomfortable while traveling with others because of needing to stop for a restroom?	1	2	3	4	5	6
27. Affected your relationships with family and friends?	1	2	3	4	5	6
28. Caused you to decrease participating in social gatherings, such as parties or visits with family or friends?	1	2	3	4	5	6
29. Caused you embarrassment?	1	2	3	4	5	6
30. Interfered with getting the amount of sleep you needed?	1	2	3	4	5	6
31. Caused you to have problems with your partner or spouse?	1	2	3	4	5	6
32. Caused you to plan activities more carefully?	1	2	3	4	5	6
33. Caused you to locate the closest restroom as soon as you arrive at a place you have never been?	1	2	3	4	5	6

Coyne KS, et al. Qual Life Res 2002; 11:563-574.

Appendix D The Patient Perception of Bladder Condition (PPBC)

Which of the following statements describes your bladder condition best at the moment? Please mark "X" in one box only.

- My bladder condition does not cause me any problems at all.
 My bladder condition causes me some very minor problems.
 My bladder condition causes me some minor problems.
 My bladder condition causes me (some) moderate problems.
 My bladder condition causes me severe problems.
 My bladder condition causes me many severe problems.

Coyne KS, et al. Eur Urol 2006; 49:1079-1086.

Appendix E OABSS in Chinese Version

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。

of production needed for a Chinese version of the Homma OABSS. The process involved forward and backward translation, review by urologists and gynecologists in expert meetings in Taiwan (hosted by Professor Kuo) and in Japan (hosted by Professor Homma). The validated OABSS in Traditional Chinese is now available (Appendix E) and has been posted on the official website of the TCS (<http://www.tcs.org.tw>).

CONCLUSIONS

OAB is a symptom-based condition without physiological markers of disease activity. A proper questionnaire is essential for diagnosis and evaluation of treatment outcomes. At present, there is no widely accepted questionnaire available for all clinicians and patients. Linguistic validation of these questionnaires in Traditional Chinese for Taiwanese people is essential. The translation and validation of the OABSS is the first step. Further work, including linguistic validation of the other measuring tools for OAB, is also needed.

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