

Relationship between quality of life and treatment satisfaction in patients with overactive bladder in a community hospital

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Overactive bladder (OAB) is treated primarily with drug treatment. While the effects of drug treatment on quality of life (QOL) in patients with OAB served by community hospitals have been evaluated, treatment satisfaction among this population has not been sufficiently studied. To address this deficit, we conducted a survey of treatment satisfaction among patients with OAB to determine whether treatment satisfaction correlates with QOL.

Questionnaires were used to determine QOL and treatment satisfaction of patients with confirmed OAB who were treated in a community hospital on an outpatient basis. Patient QOL was evaluated using the Overactive Bladder-questionnaire Short Form, and treatment satisfaction was assessed with a multidimensional questionnaire. Correlations among treatment satisfaction domains were investigated with principal component analysis. Multiple regression analysis was used to evaluate the correlation of QOL and treatment satisfaction.

Survey participants comprised 65 individuals (37 men, 28 women). Mean age was 70.4 years (standard deviation, 11.2 years). Participants were generally satisfied with their current OAB drug treatment. Treatment satisfaction correlated positively with health-related QOL (HRQOL). Multiple regression analysis revealed that the emotional and social domains of HRQOL correlated independently with treatment satisfaction.

The findings of this survey regarding satisfaction with drug treatment among patients with OAB indicate that investigating the relationship between patient health and treatment satisfaction could reveal useful information about pharmacotherapy compliance and continuation. In OAB drug treatment, caregivers may find that focusing on the QOL for the patients with OAB they care for will help in building stronger relationships with these patients.

Key words; Overactive bladder; Pharmacotherapy; Quality of life; Treatment satisfaction

Received September 14, 2021; Accepted November 9, 2021

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1. Introduction

Overactive bladder (OAB) syndrome is often characterized by four elements: urinary urgency, pollakiuria, nocturia, and urge incontinence. This condition is clinically diagnosed on the basis of unpleasant storage symptoms. OAB syndrome requires urinary urgency, normally involves pollakiuria and nocturia, and does not require urge incontinence¹⁻³⁾. Experts in lower urinary tract dysfunction, however, have yet to reach a consensus regarding how best to manage and treat OAB⁴⁾. The frequency of OAB attacks and the refractory nature of this chronic condition impact quality of life (QOL)^{2,4,5)}.

Many forms of behavioural therapy, lifestyle guidance, drug treatment and neuromodulation have been developed to treat OAB. However, after initial behavioural therapy and lifestyle guidance, OAB is primarily treated using drugs. Anticholinergic drugs are the most commonly used drugs for treating OAB. Anticholinergic drugs such as solifenacin⁶⁻⁹⁾ and fesoterodine^{10,11)} relieve the urinary urgency, pollakiuria, nocturia, and urge incontinence associated with OAB. Moreover, anticholinergic drugs significantly improved QOL for patients with OAB as measured with the Overactive Bladder questionnaire (OAB-q) in a placebo-controlled study¹²⁾, improved symptom bother and health-related quality of life (HRQOL) associated with OAB^{13,14)}, and were associated with alleviation of symptoms as evaluated with the Overactive Bladder Symptom Score (OABSS)^{15,16)} and QOL as evaluated with the OAB-q^{14,17,18)}.

Anticholinergic drugs are the most important form of drug treatment for OAB, but OAB

refractory to treatment with anticholinergic drugs should be carefully re-evaluated to identify potential hidden medical conditions¹⁹⁾. Evaluating drug treatment for patients with OAB in association with treatment expectations and QOL improvements is thus important to improve interactions with patients in a manner mindful of maximizing treatment compliance. A recent long-term observation of HRQOL and health in men and women with OAB based on the OAB-q evaluated the clinical benefits of drug treatment²⁰⁾. An investigation of the effects of drug treatment on the HRQOL of men with OAB using OABSS and the King's Health Questionnaire concluded that the mental health of patients must be considered in decision-making about OAB drug treatment²¹⁾. A survey of patient satisfaction with drug treatment revealed that satisfaction can be reduced by poor efficacy and the presence of adverse events²²⁾. These studies involved observations made with OAB-specific health questionnaires and evaluated satisfaction in terms of treatment-specific adverse events such as thirst and constipation.

To the best of our knowledge, no study has been conducted to evaluate treatment satisfaction in Japanese patients with OAB based on a multidimensional approach that includes the convenience of medication use and information provided by healthcare professionals. Our study evaluated treatment satisfaction among outpatients of a community hospital with subjective symptoms of OAB who were receiving drug treatment. Treatment satisfaction was assessed using patient-completed questionnaires. The objective was to investigate the relationship between QOL and treatment satisfaction in patients with OAB to identify factors relevant to treatment satisfaction.

2. Methods

1. Study design

In a community hospital, we conducted a questionnaire survey to evaluate treatment satisfaction among adult male and female outpatients who had been diagnosed with OAB. The patients provided written informed consent for the publication of any associated data. If there were any questions about the questionnaire, the medical staff provided explanations and collected the questionnaire once completed. For treatment satisfaction results, we compared the relationship with QOL among OAB patients.

2. Participants

The survey targeted outpatients who were visiting Inagi Municipal Hospital of Japan. Participants were OAB patients judged to have a urinary urgency score ≥ 2 and a total score ≥ 3 based on the OABSS¹⁶⁾ and who had been taking therapeutic agents for ≥ 1 month. Other inclusion criteria were being fluent and literate in Japanese. Exclusion criteria comprised urinary diversion, a history of/or active malignant tumour of the urinary tract, haematuria, bladder stones, neurogenic bladder, dementia, mental retardation, and symptomatic urinary tract infection. Patients were enrolled between May 2015 and March 2017.

3. Assessments

The Overactive Bladder-questionnaire Short Form (OAB-q SF) was used to assess QOL of OAB patients. The OAB-q SF contains two main subscales of symptom bother and HRQOL. The OAB-q SF includes 19 items: a 6 - item symptom

bother scale; and a 13 - item HRQOL scale. Authorization to use the OAB-q SF was obtained from the Pfizer Co., Ltd²³⁾.

We investigated the satisfaction level with drug therapy for patients with OAB using a questionnaire. The treatment satisfaction questionnaire for OAB medication contains 5 subscales. This treatment satisfaction questionnaire consists of 13 items with 5 domains, and the sum of direct scores for these items yields a total score between 0 and 70, which is then transformed into a 0–100 scale. The five subscales are also summed separately, with each transformed into scores of 0–100. Treatment satisfaction domain scores range from 0 to 100, with higher scores representing higher satisfaction on that domain. The questionnaire was reviewed by the authors, including urologists, and domains and questions were created. Factors influencing patient-reported treatment satisfaction were analyzed in comparison with the QOL of patients.

4. Statistical analysis

A sample size of at least 50 participants was considered adequate for validation of questionnaires²⁴⁾. We therefore aimed to include more than 50 patients. Data are expressed as the mean (\pm standard deviation), and some as the median. Statistical analyses were performed using IBM SPSS Statistics, version 26.0 (IBM Corp., Armonk, NY, USA). Values of $P < 0.05$ were considered indicative of statistical significance. We used the following statistical methods depending on the type of data. The Mann-Whitney U test, Kruskal-Wallis test, Steel-Dwass test and Friedman rank-sum test were used to analyse differences between groups. Using principal component analysis, we investigated the nature of the data from

the interrelationships between domains of treatment satisfaction. Spearman's rank correlation test was performed to detect correlation coefficients between factors. Principal component analysis was performed by the Varimax method with Kaiser normalization. The method terminates when no more variables are eligible for inclusion or removal. This method is based on both probability-to-enter ($P_{in} = 0.05$) and probability-to-remove ($P_{out} = 0.10$). For relationship between QOL and treatment satisfaction in OAB patients, a regression equation was derived using the least squares method, and the coefficient of determination (R^2) and P -value were derived from Pearson's product moment correlation coefficient. Multiple linear regression analysis with a stepwise forward-backward selection method was used to examine whether treatment satisfaction was independently associated with QOL. This included adjustment for covariates of symptom bother and HRQOL subscales. We also added gender, duration of medication, and medicine used to the variables. Multicollinearity was assessed using the variance inflation factor coefficient. Friedman's test was also used for the nonparametric data that were repeatedly measured by changing three or more conditions for one sample without following a normal distribution. Furthermore, if a significant difference was observed, a multiple comparison method was performed using EZR version 4.0.3²⁵⁾.

5. Ethical regulation

The questionnaire survey procedures and procedure for obtaining informed consent were approved by the Ethics Research Committee of Inagi Municipal Hospital and Nihon University, School of Pharmacy (approval no. 15-002). This study was conducted in accordance with the

principles outlined in the Declaration of Helsinki. Before participation, each subject was given a description of the purpose of the survey and provided written informed consent.

3. Results

1. Descriptive and univariate analyses

In the study, 37 men and 28 women (total, 65 participants) were enrolled. Mean age was 70.4 ± 11.2 years. All questionnaires were fully completed. Table 1 shows the demographic characteristics of participants as determined using the OAB-q SF. A higher score on the symptom bother scale indicates greater symptom severity, whereas a higher score on the HRQOL scale indicates better HRQOL, so these scores are inversely related. QOL scores showed no significant differences when analyzed in subgroups according to sex, age, duration of drug use, therapeutic classification of the drug used, dosing regimen, and medication adherence. However, a significant difference in OAB-q SF symptom bother score or HRQOL score was present between patients on fesoterodine and patients on solifenacin ($P < 0.05$) or imidafenacin ($P < 0.05$).

2. Treatment satisfaction among OAB patients

Median total treatment satisfaction score among patients with OAB was 70.0 (interquartile range, 61.4–75.7; mean, 68.1). In addition, median efficacy score was 50.0 (interquartile range, 50.0–66.7; mean, 53.6), median adverse event score was 100 (interquartile range, 87.5–100; mean, 92.0), and median convenience, information, and general satisfaction scores were each 66.7 (interquartile range, 61.1–66.7, 50.0–66.7, and 50.0–66.7; means,

Table 1 Patient characteristics and baseline outcomes of measurements for QOL

Characteristic	n (%)	QOL			
		OAB-q SF score	Symptom bother† <i>P</i> value	OAB-q SF HRQOL‡ score	HRQOL‡ <i>P</i> value
No. patients	65	27.9 ± 21.0		74.5 ± 20.1	
Gender			0.1319 ^a		0.5246 ^a
male	37 (56.9)	25.8 ± 22.3		74.8 ± 22.6	
female	28 (43.1)	30.8 ± 18.7		73.5 ± 18.8	
Age (years)			0.9350 ^b		0.3875 ^b
<60	10 (15.4)	30.3 ± 19.1		66.3 ± 18.8	
60 ≤ <69	17 (26.2)	27.6 ± 20.7		77.9 ± 15.9	
70 ≤ <79	26 (40.0)	28.6 ± 22.7		73.9 ± 20.7	
80 ≤	12 (18.5)	25.0 ± 18.5		78.1 ± 22.9	
70.4 ± 11.2	65				
Duration of medication			0.6075 ^b		0.2773 ^b
1 ≤ <5 months	18 (27.7)	33.1 ± 22.9		70.2 ± 23.8	
5 ≤ <12 months	10 (15.4)	30.3 ± 27.2		74.0 ± 23.4	
1 ≤ <4 years	25 (38.5)	26.7 ± 18.3		73.4 ± 16.0	
4 years ≤	12 (18.5)	20.8 ± 13.7		83.7 ± 15.4	
Medicine used					
Classification by action mechanism			0.5527 ^b		0.1091 ^b
Anticholinergics	51 (78.5)	27.2 ± 21.3		74.8 ± 19.3	
β ₃ -adrenergic agonists	4 (6.2)	37.5 ± 15.7		60.4 ± 27.4	
Anticholinergics + α ₁ -adrenoceptor antagonists	3 (4.6)	14.4 ± 8.3		93.3 ± 7.4	
Anticholinergics + β ₃ -adrenergic agonists	2 (3.1)	30.0 ± 0.0		75.4 ± 12.3	
β ₃ -adrenergic agonists + α ₁ -adrenoceptor antagonists	2 (3.1)	40.0 ± 36.7		50.8 ± 12.3	
Drugs			0.0023 ^b		0.0040 ^b
Anticholinergics					
Solifenacin	23 (35.4)	25.1 ± 16.2		82.9 ± 11.7*	
Fesoterodine	13 (20.0)	42.6 ± 22.6		56.2 ± 20.9	
Imidafenacin	7 (10.8)	10.0 ± 7.6*		83.1 ± 8.1*	
Propiverine	4 (6.2)	14.2 ± 15.3		80.8 ± 16.4	
Tolterodine	1 (1.5)	73.3		44.6	
Oxybutynin	1 (1.5)	3.3		96.9	
Solifenacin + Fesoterodine	1 (1.5)	40.0		49.2	
Fesoterodine + Imidafenacin	1 (1.5)	13.3		80.0	
β ₃ -adrenergic agonists					
Mirabegron	4 (6.2)	37.5 ± 15.7		60.4 ± 27.4	
Anticholinergics + α ₁ -adrenoceptor antagonists					
Imidafenacin + Naftopidil	1 (1.5)	23.3		83.1	
Imidafenacin + Silodosin	1 (1.5)	3.3		100.0	
Propiverine + Silodosin	1 (1.5)	16.7		96.9	
Anticholinergics + β ₃ -adrenergic agonists					
Solifenacin + Mirabegron	1 (1.5)	30.0		63.1	
Fesoterodine + Mirabegron	1 (1.5)	30.0		87.7	
β ₃ -adrenergic agonists + α ₁ -adrenoceptor antagonists					
Mirabegron + Naftopidil	1 (1.5)	3.3		63.1	
Mirabegron + Silodosin	1 (1.5)	76.7		38.5	
Other drugs					
Fesoterodine + Goshajinkigan(kampo formula)	1 (1.5)	46.7		81.5	
Propiverine + Imipramine	1 (1.5)	33.3		87.7	
Fesoterodine + Imidafenacin + Flavoxate	1 (1.5)	16.7		87.7	
How to take medicine			0.3232 ^b		0.5571 ^b
Once a day	49 (75.4)	30.2 ± 21.4		74.0 ± 20.7	
Twice a day	13 (20.0)	19.7 ± 19.1		78.1 ± 19.5	
Several times a day	2 (3.1)	28.3 ± 11.7		66.2 ± 4.6	
Several times a week	1 (1.5)	23.3		67.7	
Medication adherence			0.3614 ^a		0.3886 ^a
Use as instructed	60 (27.7)	27.6 ± 21.5		74.7 ± 11.0	
Use roughly as instructed	5 (15.4)	32.0 ± 13.1		71.4 ± 11.0	
Do not use much as instructed	—	—		—	
Do not use as instructed	—	—		—	

Values are number of patients (%) or mean ± standard deviation where appropriate.

†The score ranges from 0 to 100, where 0 = minimal symptom severity and 100 = grt symptom severity.

‡The score ranged from 0 to 100, where 0 = worst HRQOL outcome/response and 100 = best HRQOL outcome/response.

P values indicate the association with sex, age, duration of medication, medicine used (classification by mechanism of action and drugs), how to take medicine or medication adherence.

QOL, quality of life; HRQOL, health-related quality of life; OAB-q SF, overactive bladder quality of life short-form questionnaire.

—: None., ^aMann-Whitney *U* test., ^bKruskal-Wallis test., **p* < 0.05 versus fesoterodine, Steel-Dwass test.

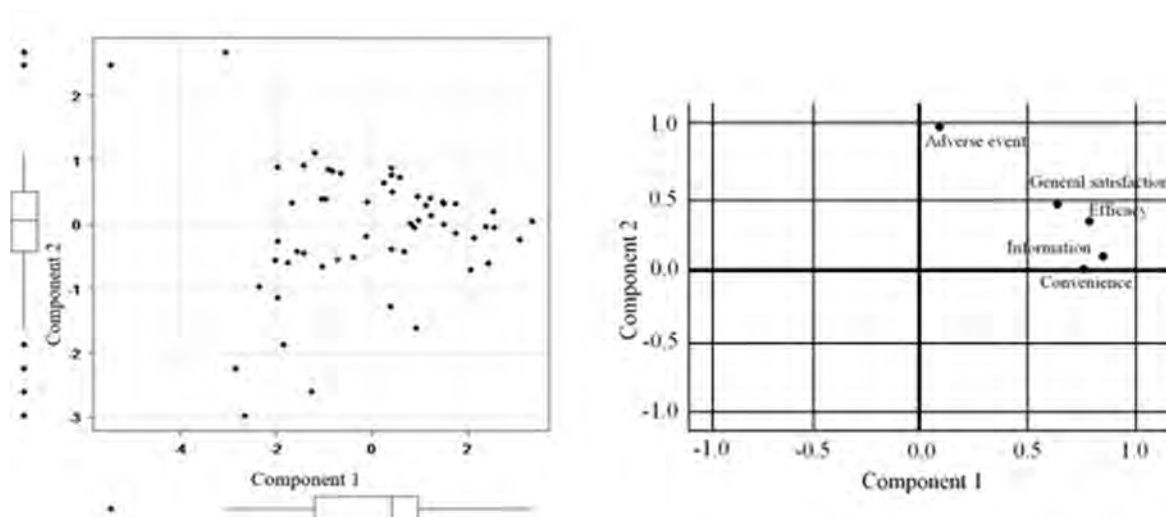


Figure 1 Results for the principal component analysis

Left Figure: Score plots of principal component, Right Figure: Component plots after varimax rotation.

Table 2 Analysis of the factor loading for question items related to the degree of treatment satisfaction among patients.

Variable	principal component		Commonality (h ²)
	1 Reliability	2 Security feeling	
Efficacy	0.791	0.296	0.713
Adverse event	0.095	0.960	0.931
Convenience	0.781	0.0002	0.609
Information	0.864	0.079	0.752
General satisfaction	0.689	0.459	0.685
Eigenvalues	2.464	1.226	3.690
Variance explained (%)	49.29	24.52	73.81

Principal component analysis; Varimax method, an orthogonal rotation method that minimizes the number of variables that have high loadings on each factor.

Only principal components with eigenvalues greater than 1 were used.

64.9, 63.2, and 60.5, respectively). The results for the principal component analysis were shown in Figure 1. Outliers were found on the principal component score plots, and treatment satisfaction was low in these patients. Variance in principal components was as shown in Table 2, and the cumulative contribution was 73.81%. The main variables making up the first principal component

were efficacy, convenience, information, and general satisfaction. Adverse events showing limited incidence contributed little. This component represents 49% of the total. The main variable making up the second principal component was adverse events.

3. Factors affecting treatment satisfaction

Table 3 Association between demographic characteristics and total treatment satisfaction score

Characteristics	All patients (n=65)	<i>P</i> value
Gender	28(43.1)	0.582 ^a
Age (years)	70.4 ± 11.2	0.539 ^b
Duration of medication(months)	25.6 ± 22.8	0.579 ^b
Medicine used		
Classification by action mechanism n, (%)		0.299 ^c
Anticholinergics	51 (78.5)	
β ₃ -adrenergic agonists	4 (6.2)	
Anticholinergics + α ₁ -adrenoceptor antagonists	3 (4.6)	
Anticholinergics + β ₃ -adrenergic agonists	2 (3.1)	
β ₃ -adrenergic agonists +α ₁ -adrenoceptor antagonists	2 (3.1)	
Drugs n, (%)		0.363 ^c
Solifenacin	23 (35.4)	
Fesoterodine	13 (20.0)	
Imidafenacin	7 (10.8)	
Propiverine	4 (6.2)	
Mirabegron	4 (6.2)	
How to take medicine n, (%)		0.512 ^c
Once a day	49 (75.4)	
Twice a day	13 (20.0)	
Several times a day	2 (3.1)	
Several times a week	1 (1.5)	
Medication adherence n, (%)		0.711 ^a
Use as instructed	60 (27.7)	
Use roughly as instructed	5 (15.4)	
OAB-q SF		
Symptom bother (score)	27.9 ± 21.0	0.029 ^b
HRQOL (score)	74.5 ± 20.1	0.001 ^b

Values are number of patients (%) or mean ± standard deviation where appropriate.

P values indicate the association with total treatment satisfaction score.

OAB-q SF, overactive bladder quality of life short-form questionnaire; HRQOL, health-related quality of life.

^aMann-Whitney *U* test.

^bSpeaman's rank correlation.

^cKruskal-Wallis test.

Associations between total treatment satisfaction score and the demographic characteristics of the patients are shown in Table 3. The total treatment satisfaction score was significantly correlated with OAB-q SF symptom bother score and HRQOL score. Moreover, OAB-q SF HRQOL score showed a significant positive correlation with total treatment satisfaction score (Figure 2). We performed multiple regression analysis including symptom bother and HRQOL subscales as covariates. This analysis revealed that HRQOL

emotional/social was independently associated with total treatment satisfaction score (total treatment satisfaction score = 0.192 × emotional/social + 52.149; $R^2 = 0.122$, $P < 0.01$) (Table 4).

4. Discussion

The less-than-satisfactory rates of treatment compliance and continuation in the drug treatment of OAB²⁶⁾ must be addressed. In addition, treatment satisfaction as rated by OAB patients agrees poorly

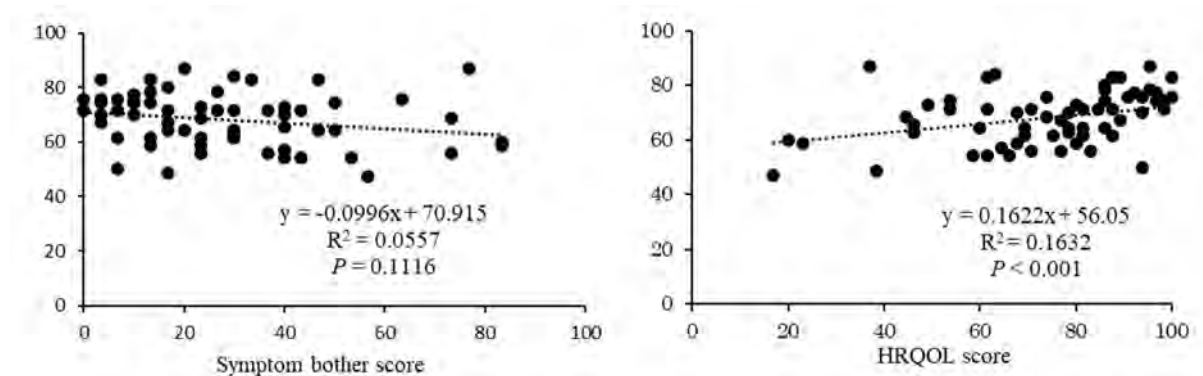


Figure 2 Relationship between quality of life and treatment satisfaction in overactive bladder patients
 In the study population, higher symptom bother scores tended to be associated with lower treatment satisfaction, and higher HRQOL scores were associated with higher treatment satisfaction.
 HRQOL, health-related quality of life.

Table 4 Multiple regression analysis of treatment satisfaction

Variable	Unstandardized coefficient				t	Standard coefficient	VIF	P value
	β	Standard error	95% CI of β					
HRQOL								
Emotional/Social	0.192	0.065	0.062	0.322	2.955	0.349	1.000	0.004
Constant	52.149	5.550	41.059	63.238	9.397			< 0.001

Adjusted $R^2 = 0.122$, ANOVA $P < 0.01$

with that rated by the treating physicians, highlighting the need to measure satisfaction from the perspective of the patient²⁷⁾. The present study evaluated QOL and satisfaction with treatment among community hospital outpatients with OAB confirmed by OABSS (i.e., urinary urgency score ≥ 2 ; total score ≥ 3) who had been taking a drug to alleviate OAB symptoms for at least 1 month as of the start of the study. The objective was to identify factors impacting treatment satisfaction. The results of a cross-sectional questionnaire showed that the total composite score for treatment satisfaction increased significantly in association with increasing HRQOL score. The results also suggest

that the emotional and social aspects of OAB patients are associated with treatment satisfaction.

With regard to baseline patient characteristics, the study population included many elderly patients. The drug class most widely used by participants was anticholinergic drugs, followed by β_3 -adrenergic agonists in a small number of participants. This is considered to be similar to the current state of drug use for OAB patients. Mean OAB-q SF symptom bother and OAB-q SF HRQOL scores in participants resembled those in evaluations of QOL among Japanese men and women with OAB^{14,28,29)}. Treatment appears to have had a certain effect in participants with subjective symptoms (Table 1).

The Japanese version of the OAB-q SF has demonstrated reliability and validity¹⁸⁾ and established tabulation procedures. OAB, which impacts QOL in a variety of lifestyle domains^{14,30)}, is preferably evaluated in terms of symptom bother and HRQOL. Characterizing the symptoms of patients with OAB using a QOL questionnaire should help improve the quality of treatment. Studies have shown that drug treatment significantly alleviated symptom bother and improved HRQOL associated with OAB¹³⁾ and that alleviation of symptoms as measured with OABSS correlates with improved QOL as measured with OAB-q¹⁴⁾. Anticholinergics have established efficacy and safety profiles in the treatment of OAB among elderly patient ≥ 65 years old and contribute to better QOL in this population³¹⁾. Participants in the present study showed good medication adherence, with drug treatment providing a certain effect in terms of QOL, and no significant differences were seen among scores classified according to sex, age, or therapeutic classification of the drug used. However, as the primary objective of the study was to survey the drug therapies used by patients with OAB in a community hospital, further investigation with a larger sample size is necessary to evaluate the effects of individual drugs on QOL.

Studies have shown that at least 65% of patients with OAB experience OAB symptoms that adversely affect QOL³²⁾, and that about 30% of patients with OAB are dissatisfied with both bladder symptoms and drug treatments³³⁾. Anticholinergic drugs are generally safe, effective, and well tolerated in OAB and improve QOL scores, but treatment compliance and continuation are not always satisfactory²⁶⁾. Drug treatment for patients

with OAB should therefore be managed by determining treatment satisfaction in addition to evaluating QOL. Median total treatment satisfaction score among patients with OAB in this study was 70.0 (interquartile range, 61.4–75.7), indicating general satisfaction with treatment. Principal component analysis of treatment satisfaction was performed because the individual variables are combined. The main variables making up the first principal component were efficacy, convenience, information, and general satisfaction, suggesting that participants trusted their treatments and considered the treatments effective. The main variable making up the second principal component was adverse events, and general satisfaction, as part of the first principal component, also contributed moderately. This finding, taken alone, suggests that participants felt secure about their drug treatments (Table 2). A study of men and women with OAB on anticholinergic drugs found that OAB symptoms, clinical efficacy, and adverse events (thirst and constipation) are related to patient satisfaction, with clinical efficacy being the most relevant²²⁾. Other studies have revealed that the OAB voiding symptom of nocturia was associated with less nighttime sleep and poorer sleep quality³⁴⁾ and this could consequently reduce physical and mental health³⁵⁾. Nocturia is considered the main factor behind reduced QOL and treatment satisfaction^{22,36)}. Although the survey of satisfaction in the present study was not intended to compare satisfaction among variables, our findings suggest that drug treatment efficacy is associated with the treatment satisfaction of patients with OAB, highlighting the need for caregivers to approach drug treatment with a commitment to determining the OAB subjective symptoms of their patients. Fourteen of the 65

participants (21.5%) reported having experienced an adverse event. The median treatment satisfaction score for these patients was 57.9(interquartile range, 54.6–68.2), which was found to be low. Thirst and constipation attributable to drug use impact the satisfaction of Japanese patients with OAB^{22,37}. Thirst, constipation, and other physical adverse events can impact the satisfaction of patients with OAB and may even reduce satisfaction in terms of adverse events. Since this likely substantially affects the treatment satisfaction of patients with OAB, adequate monitoring for adverse events is critical in routine clinical settings. Instruments used to gauge satisfaction in patients with OAB include the Patient Satisfaction with Treatment Benefits (PSTB) questionnaire³⁸, which considers OAB symptoms, and the condition-specific Overactive Bladder Treatment Satisfaction Questionnaire (OAB-S)³⁹. In addition, there is also the treatment satisfaction questionnaire to be used in many different disease contexts⁴⁰, but studies in OAB patients has not been reported. Since no survey methodology for properly evaluating treatment satisfaction in Japanese patients with OAB has been established, our findings cannot readily be compared with those of previous reports because of the different participant characteristics and methodologies involved. However, the multidimensional nature of the survey form used in the present study consisted of questions suited to patients with OAB, and we are convinced that they successfully gauged treatment satisfaction in this population, at least to a certain extent.

The primary objectives of this study were to use a QOL survey to determine the status of drug treatment and then determine treatment satisfaction in patients with subjective symptoms of OAB, to

characterize the relationship between QOL and treatment satisfaction in this population and thus support treatment compliance and continuation. The HRQOL and total treatment satisfaction scores in the study population were related, showing that HRQOL affects treatment satisfaction (Figure 2). From this result, it was suggested that the treatment satisfaction was properly evaluated. Moreover, the study results suggest that the emotional and social components of HRQOL correlate with treatment satisfaction among patients with OAB. One factor behind this finding is likely the fact that the emotional/social score of 83.3 ± 19.1 was significantly higher than the other scores of 69.7 ± 26.8 and 67.8 ± 28.9 ($P < 0.001$, Friedman's test). OAB appears to create few impediments to the emotional and social functioning of OAB patients in daily settings. We believe that tailoring the care and treatment of patients through an understanding of what is important to the specific patient will help improve patient satisfaction.

This study had several limitations. First, OAB symptoms were not qualitatively evaluated at the start of the study, because the study population comprised patients put on drug treatment after previously receiving an OABSS-based diagnosis of OAB. The relationship of OAB severity to QOL and treatment satisfaction was therefore not considered. Second, QOL scores differed for some of the anticholinergic drugs that participants used. These differences may have affected satisfaction. Data from more patients are needed to better evaluate different drugs in consideration of differences in muscarinic receptor affinity. Third, since studies of satisfaction should be conducted with a questionnaire validated for reliability, suitability, and participant responsiveness, the questionnaire

form we used will be validated in the future.

In conclusion, this study determined QOL and evaluated the clinical benefit of drug treatment in a population of patients with OAB free of comorbidities that could impact OAB symptoms. The drug treatments of the study population are therefore reflective of treatments in patients with OAB in general. The study population—patients with OAB treated at a community hospital—were generally satisfied with their drug treatments, and HRQOL was associated with treatment satisfaction. These findings should help inform efforts to improve drug treatment compliance and continuation. In OAB drug treatment, caregivers may find that focusing on the QOL of the patients with OAB they care for will help in building stronger relationships with these patients.

Acknowledgement

We wish to thank Tatsuaki Daimon, M.D. and Minoru Horinaga, M.D. from Inagi Municipal Hospital for their cooperation in collecting the questionnaires.

Conflict of Interest

None of authors has any conflict of interest to declare. Junichi Nishino is currently an employee of Otsuka Pharmaceutical Co., Ltd.; however, this work is completely unrelated to the author's work with Otsuka Pharmaceutical Co., Ltd.

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