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Factors Associated With Quality Of Life In Women Undergoing Surgery For Stress Urinary Incontinence

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Abstract

Purpose—To determine the association of clinicodemographic factors with urinary incontinence (UI) related quality of life (QoL) in women having surgery for stress urinary incontinence (SUI) and to compare the incontinence-specific IIQ (Incontinence Impact Questionnaire) and the ICIQ (International Consultation on Incontinence Questionnaire). Secondary objectives evaluated the contributions of incontinence severity and sexual function to QoL.

Materials and Methods—Baseline data from 597 women in the Trial of Mid Urethral Slings (TOMUS). Correlates of QoL tested included health status and history, type, severity and bother of UI, and sexual function.

Results—Lower QoL by both the IIQ and ICIQ included younger age, higher BMI, more SUI symptoms, and more severe and bothersome UI symptoms. Each measure identified factors associated with lower QoL not identified by the other (IIQ; Hispanic ethnicity, poor health status and more urge UI symptoms, and ICIQ; prior UI treatment and more UI episodes per day). Sexually active women had similar QoL but also increased incontinence episodes (IIQ and ICIQ) and more sexual dysfunction (IIQ only).

Conclusion—In women planning SUI surgery, QoL is associated with non-UI factors as well as with the type, severity and degree of bother from UI symptoms. Many factors are associated with QoL as measured by both IIQ and ICIQ. However more non-UI factors were associated with QoL when measured by the IIQ than by the ICIQ. More than one scale may be needed to evaluate QoL after SUI treatment.

Keywords

Urinary incontinence; Quality of life; Midurethral sling

Introduction

Urinary incontinence (UI) affects between 25% and 45% of adult women and has a negative impact on various measures of quality of life^{1,2}. Quality of life (QoL) assessment is increasingly important in patient care and as an outcome of randomized clinical trials for urinary incontinence³. Surgery for stress urinary incontinence (SUI) is common and uncertainty remains whether subjective patient-reported factors, including QoL measures, or more objective data are more appropriate to assess the outcomes of surgical treatment.

Previous studies have shown that greater UI severity and symptom bother are associated with decreased QoL as measured by validated incontinence-specific instruments. We previously reported that a diminished QoL as measured by the IIQ in stress incontinent women before surgery was related to greater frequency of stress UI symptoms, increasing severity, greater symptom bother, prior UI surgery or treatment, and sexual dysfunction (if sexually active)⁴. We also found that current tobacco use, younger age, lower socioeconomic status, and Hispanic ethnicity were associated with lower incontinence-related QoL⁴. Although there is an association between UI severity and QoL among women with SUI, there may be other factors that contribute to QoL in these women.

Our primary objective was to confirm the association of various clinical and demographic factors with incontinence-related QoL in women seeking surgery for SUI. Secondary objectives were to assess the contributions of incontinence severity and sexual function to QoL. Finally we sought to compare these associations for two measures of incontinence-specific QoL, the IIQ and the ICIQ.

Materials and Methods

We previously reported the design of the Trial of Midurethral Slings⁵, a randomized surgical trial comparing retropubic and transobturator midurethral slings conducted at 9 clinical sites in the United States as part of the Urinary Incontinence Treatment Network. Five hundred ninety seven women with pure or predominant stress UI based on their responses to the Medical Epidemiologic and Social Aspects of Aging (MESA) questionnaire⁶ were randomized to receive a retropubic or transobturator midurethral synthetic sling. All women demonstrated stress UI on pre-operative bladder stress test.

We assessed the impact of UI on patient's QoL using two condition-specific measures: the International Consultation on Incontinence Questionnaire (ICIQ)⁷ and the Incontinence Impact Questionnaire (IIQ)⁸. The former measure assesses the impact of UI on everyday life whereas the latter measure assesses the impact of UI on various activities, roles, and emotional states.

Self-reported stress-type UI symptoms were collected using selected items regarding stress and urge-type UI symptoms taken from the questionnaire for the Medical, Epidemiologic, and Social Aspects of Aging Project (MESA)⁶. These items query the patient's description of how urine loss occurred. Questions referring to loss of urine at times of exertion such as laughing, sneezing, lifting or bending over define SUI while questions referring to urine loss preceded by an urge to void or uncontrollable voiding with little or no warning define urge incontinence. For the purposes of this trial, predominant SUI is defined as the percent of stress-type symptoms > the percent of urge-type symptoms on the MESA questionnaire.

Agreement between UI defined by the MESA questions and a clinician's assessment of UI has been reported as 87% for women⁶. The authors further noted that self-reported symptoms of SUI had an accuracy of 69% in predicting a urodynamic diagnosis of SUI.

Patient bother was measured by the subscales of the Urogenital Distress Inventory (UDI) which quantify stress UI symptoms, urge symptoms and voiding symptoms⁸. For each symptom experienced, bother is rated on a scale from 0 (not at all bothersome) to 3 (Greatly bothersome). Overall bother was computed as the average of the bother of the symptoms reported and ranged from 0 to 3. Severity of incontinence was defined by the number of incontinence episodes recorded in a 3-day bladder diary averaged over the three days. In addition, the Patient Global Impression of Severity (PGI-S) was administered to gather information regarding a woman's overall appraisal of her condition⁹. PGI-S has been shown to correlate with incontinent episode frequency, pad test outcomes and incontinence-specific QoL scores⁹. A unique benefit provided by this instrument is its ability to account for the preferences of individual patients.

Little is known about the sexual function of women with UI. As with measurement of QoL, an incontinence-specific measure of sexual function was used in this trial. The short form of the Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ) developed by Rogers et al is a 12-item self-administered questionnaire for which adequate validity, reliability, and sensitivity to change have been reported^{10,11}. A validated Spanish version of the PISQ-12 was used¹² for Spanish speaking participants.

Sociodemographic variables recorded included age (years), race/ethnicity (4 categories), and occupational class using the Nam-Powers-Boyd Occupational Status Scores¹³. The Nam-Powers score ranks occupations based on educational requirements and expected salary on a scale from 0 to 100, where a higher score indicates greater status. This score was used as a proxy measure for socioeconomic status. Measures of health status and history included body mass index (BMI), past treatment or surgery for UI (yes/no), smoking status (never, former, current), anal incontinence (liquid stool, solid stool, and/or gas at least monthly), and history of frequent urinary tract infections (yes/no).

Analysis

Continuous variables were reported with mean, standard deviation (SD) and range, while categorical variables were presented with frequency and its percentage.

Multiple regression analysis was performed to investigate the relationships with QoL (i.e. IIQ/ICIQ) of demographic factors, health status and history items, type and severity of UI, and bother of UI symptoms.

To investigate whether sexual function had an additive effect in explaining variability in QoL, the same analysis was conducted with the subset of sexually active women. Analyses were performed using SAS version 9.2 (SAS Institute, Inc. Cary, NC). A 5% two-sided significance level was used for all statistical testing.

Results

Sample

Women in this study were predominantly Caucasian, middle-aged [average 52.9 (SD 11.0) years] yet socioeconomically diverse. They reported an average 3.3 (SD 3.0) incontinent episodes per day. By trial design, they all had stress UI (mean of MESA stress index = 71.6, SD 17.0), but many also reported some degree of urge UI (mean MESA urge index = 34.8,

SD 22.0). Over half reported prior treatment for UI and concomitant anal incontinence. The mean BMI was 30.3 (SD 6.7)

Correlates of Quality of Life

The results of the multiple regression analyses are presented for all women in Table 1 and for sexually active women in Table 2. The results of the models for all women show that almost half (49%) of the variability in QoL as measured by both the IIQ and ICIQ is explained by the variables considered. Both measures demonstrated an association between lower QoL and younger age, higher BMI, a higher stress UI index, more severe (PGI-S) and bothersome UI (UDI-6) symptoms. The IIQ also demonstrated an association between lower QoL and Hispanic ethnicity, worse general health and higher UI index. The ICIQ demonstrated an association between lower QoL and prior UI treatment and greater number of UI episodes per day.

Among sexually active women with SUI (Table 2), the variability in QoL explained by these factors, including the measure of sexual function (PISQ), was similar to that in the full sample. The overall pattern of associations is similar to that for the full sample with one exception. A greater frequency of incontinence episodes is associated with lower QoL for both measures of QoL. Further, women who report more sexual dysfunction on the PISQ report lower QoL, controlling for all other variables, when QoL is measured by the IIQ but not by the ICIQ.

Discussion

In women seeking surgery for stress predominant UI, lower UI-specific QoL is associated with both clinical and sociodemographic variables. We used two validated measures, one to assess impact of UI on everyday life (ICIQ) and one to assess impact of UI on various activities, roles, and emotional states (IIQ). Using either measure, younger women with higher BMI reported worse UI-specific QoL. Not surprisingly, women who reported more severe UI symptoms and greater symptom bother also reported worse QoL with both measures. Interestingly, each QoL measure demonstrated associations between QoL and certain factors that the other QoL measure did not identify. For instance, when using the IIQ, lower QoL was also associated with Hispanic ethnicity, lower socioeconomic status, lower general health scores and higher urge index on the MESA, while when using the ICIQ, lower QoL was also associated with prior UI treatment and higher number of incontinence episodes.

These results highlight substantial differences between the two incontinence-specific QoL measures. The IIQ scores are influenced by socioeconomic and health status, variables that will not change after treatment of the stress incontinence. The ICIQ is influenced less by these variables and therefore may demonstrate greater improvement in QoL after SUI treatment. On the other hand patients who have undergone previous surgery may not report as much improvement in QoL as those who did not, when measured by the ICIQ.

The optimal measure for reporting UI treatment outcomes remains unclear. Most incontinence outcome measures are composites of both subjective and objective outcome measures. Patient perception of symptom bother and UI-specific QoL is an important dimension of UI outcomes. A recent subanalysis from the SISTER trial¹⁴ demonstrated a significant improvement in QoL post-operatively in women who underwent Burch or fascial sling procedures. The improvement in QoL was greater in the Burch group as opposed to the sling group. This is opposite from the primary outcome results, which demonstrated greater efficacy for the sling when compared to the Burch¹⁵. The most significant variables associated with the QoL improvement were changes in incontinence symptoms and

symptom bother. The QoL improvement was not associated with the decrease in incontinence episodes or pad weights. The IIQ was the QoL measure utilized in the study and the results are consistent with the current analysis demonstrating which variables affect QoL measured by IIQ. It would also make sense that had QoL changes been measured by the ICIQ in the SISTER trial, different results with regard to change in QoL may have been found.

Not surprisingly, stress UI symptoms had a stronger association with baseline QoL than did urge UI symptoms in this study population. The TOMUS population is narrowly defined in that all participants were bothered enough by their stress symptoms to desire surgical treatment. A population of women with urge predominant UI symptoms or who had not sought surgical treatment may not demonstrate such an association. Furthermore the urge-index is related to QoL only as measured by the IIQ, and the magnitude of this association may be affected by this particular patient population. More severe urge UI patients were not included in this study, and thus the urge index was skewed towards the lower end. It would make sense that the worse the severity of the urge UI, the greater reduction in QoL we would expect.

We have shown that condition-specific QoL measures in women seeking treatment for stress predominant urinary incontinence are associated with clinical variables characterizing the severity and character of their urinary incontinence. However, these same measures are also associated with sociodemographic variables unrelated to the urinary incontinence condition. The implications of these findings are that changes in QoL after treatment should ideally be reflected by changes in the incontinence specific clinical variables.

The relationships between different measures of incontinence severity and QoL differ by the QoL measure. The ICIQ scores are associated with incontinence episodes while the IIQ is not. Likewise the IIQ scores are associated with the amount of urge incontinence whereas the ICIQ is not. If the primary outcome of an incontinence trial was based on the number of incontinence episodes, the IIQ may not pick up that difference as well as the ICIQ.

It is interesting to note that sexual activity was associated with a decreased QoL when measured by the IIQ but not by the ICIQ. When we looked at only women who were sexually active, the associations between the clinical and demographic variables and either measure of QoL remained similar except that incontinence episodes was also associated with lower QoL when measured by the IIQ. The level of sexual function was associated with QoL when measured by IIQ but not ICIQ.

Conclusions

In women planning SUI surgery, QoL is associated with sociodemographic factors as well as with the type, severity and degree of bother from UI symptoms. While many factors are associated with QoL as measured by both IIQ and ICIQ, there are differences in the associations with QoL as assessed by each tool. More non-UI factors, including sexual activity, were associated with QoL when measured by IIQ than by ICIQ. More than one scale may be needed to comprehensively evaluate QoL after SUI treatment outcome since the patient's assessment of QoL has become an important part of the definition of treatment success.

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Table 1

Factors Related to Quality of Life in Women with Stress Urinary Incontinence: Multiple Regression Analysis of IIQ and ICIQ (N=597)

Variables	IIQ			ICIQ		
	Est. *	p-value	R ²	Est. *	p-value	R ²
			0.49			0.49
Sociodemographic						
Age	-0.76	0.02		-0.03	0.05	
Race and Ethnicity group		0.003				0.81
Hispanic	189.17			12.65		
Non-Hispanic White	158.98			12.74		
Non-Hispanic Black	140.13			13.91		
Non-Hispanic Other	183.92			13.25		
SES	-0.27	0.06		0.01	0.07	
Health Status and History						
General Health		<.0001				0.16
Excellent	140.79			12.56		
Very good	156.47			12.54		
Good	174.82			13.27		
Fair+Poor	200.14			13.19		
BMI	1.27	0.01		0.05	0.02	
Prior UI Treatment		0.09				0.003
No	162.68			12.48		
Yes	173.42			13.30		
Frequent UTIs		0.44		.		0.69
No	163.33			12.99		
Yes	172.77			12.79		

Variables	IIQ			ICIQ		
	Est.*	p-value	R ²	Est.*	p-value	R ²
Anal incontinence						
No	167.94	0.97		13.13	0.09	
Yes	168.17			12.65		
Smoking status		0.82			0.74	
Never	165.31			12.77		
Former	168.56			12.99		
Current	170.29			12.91		
UI Type and Severity						
Stress UI Index	0.77	0.0007		0.06	<.0001	
Urge UI Index	0.37	0.04		0.01	0.26	
UI Severity (PGI-S)		0.002		.	<.0001	
Normal	157.95			12.16		
Mild	158.86			11.12		
Moderate	163.69			12.63		
Severe	191.7			15.65		
Incontinence episodes/day	1.78	0.12		0.15	0.002	
Symptom bother (UDI)	0.65	<.0001		0.01	0.0007	
Sexual Activity		0.05			0.97	
Not sexually active	175.2			12.88		
Sexually active	160.9			12.89		

* Estimate is slope for continuous measures or adjusted mean for categorical measures

Table 2

Factors Related to Quality of Life in Sexually Active Women With Stress Urinary Incontinence: Multiple Regression Analysis of IIQ and ICIQ (N=405)

Variables	IIQ			ICIQ		
	Est. *	p-value	R ²	Est. *	p-value	R ²
			0.48			0.47
Sociodemographic						
Age	-0.74	0.06		-0.05	0.002	
Race and Ethnicity		0.03			0.91	
Hispanic	175.14			12.31		
Non-Hispanic White	142.69			12.31		
Non-Hispanic Black	134.54			12.23		
Non-Hispanic Other	152.85			12.76		
SES	-0.43	0.01		0.004	0.55	
Health Status and History						
General Health		0.02			0.53	
Excellent	128.14			12.09		
Very good	146.66			12.25		
Good	158.09			12.80		
Fair+Poor	172.35			12.47		
BMI	0.45	0.46		0.03	0.20	
Prior UI Treatment		0.78			0.002	
No	150.30			11.92		
Yes	152.32			12.88		
Frequent UTIs		0.69			0.14	
No	148.41			12.86		
Yes	154.21			11.94		

Variables	IIQ			ICIQ		
	Est.*	p-value	R ²	Est.*	p-value	R ²
Anal incontinence						
No	152.39	0.78		12.56	0.34	
Yes	150.23	.		12.25		
Smoking status		0.64			0.96	
Never	155.05			12.34		
Former	147.80			12.42		
Current	151.08			12.45		
UI Type and Severity						
Stress UI Index	0.45	0.10		0.04	0.0002	
Urge UI Index	0.47	0.03		0.02	0.06	
UI Severity (PGI-S)		0.0003			<.0001	
Normal	137.45			11.99		
Mild	136.55			10.60		
Moderate	148.56			12.19		
Severe	182.68			14.83		
Incontinence episodes/day	3.35	0.03		0.28	<.0001	
Symptom bother (UDI)	0.48	<.0001		0.01	0.02	
Sexual Function (PISQ_12)	-2.08	0.0002		0.03	0.20	

* Estimate is slope for continuous measures or adjusted mean for categorical measures