

Prospective evaluation of anxiety, pain, and embarrassment associated with cystoscopy and urodynamic testing in clinical practice

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See related commentary on page 111.

Abstract

Introduction: We sought to prospectively assess anxiety, pain, and embarrassment associated with diagnostic cystoscopy and multichannel urodynamic study (UDS).

Methods: All consecutive patients undergoing diagnostic cystoscopy or UDS in our department over a period of nine months were asked to participate. Two anonymous auto-administered questionnaires were specifically designed to collect basic epidemiological data, document medical history, and assess the quality of information provided, along with prevalence and level (0–10 numerical visual analog rating scale) of anxiety, pain, and embarrassment experienced before and/or during the procedures. Statistical analysis was carried out to identify underlying factors that could have influenced patients' experience and ascertain potential correlations between anxiety, pain, and embarrassment.

Results: 101 and 185 patients were respectively evaluated immediately after cystoscopy and UDS. Multivariate analysis repeatedly showed statistical correlations between anxiety, pain, and embarrassment, with regard to prevalence and level of intensity in both cystoscopy and UDS populations. Males and young patients were more likely to present anxiety, pain, or embarrassment during cystoscopy and UDS. Interestingly, patients who reported having received complete information before cystoscopy were significantly more likely to experience anxiety (62.6% vs. 20.0%; $p=0.009$).

Conclusions: The present study demonstrated the major impact of gender and age on patients' experience. Interestingly, information provided before cystoscopy was reported to have a negative impact on patients' perception of anxiety; this could be partly prevented by optimizing the way information is provided to patients.

Introduction

Cystoscopy and multichannel urodynamic study (UDS) are essential and valuable diagnostic tools in our daily urological practice. Cystoscopy is part of the evaluation process in

patients complaining of lower urinary tract symptoms (LUTS) and is undertaken repeatedly in patients being monitored for non-invasive bladder tumours. This procedure allows direct visual examination of the bladder cavity and wall to detect abnormalities, such as diverticula, stones, inflammation, and tumours. UDS is usually performed in patients complaining of LUTS or presenting neurological diseases suspected to impact the bladder-sphincter system. The procedure aims to diagnose lower urinary tract disorders through continuous measurement of abdominal, bladder, and urethral pressures during the filling and voiding phases. Despite their invasive nature, as recognized by the urological community, comprehensive evaluations of patients' experience during cystoscopy¹⁻⁵ and UDS⁶⁻⁹ are scarcely reported in the literature.

We prospectively assessed anxiety, pain, and embarrassment associated with such procedures and investigated factors that could potentially influence them to find potential ways of improving general tolerance during these examinations.

Methods

Patients

The present study was approved by our hospital research ethics committee. All consecutive patients with preserved urethral and bladder sensation referred by the two lead authors over a period of nine months for diagnostic cystoscopy or UDS were systematically asked to participate. A specific information form and an anonymous auto-administered questionnaire were given to them at the reception office. Patients who agreed to participate completed the questionnaire after the procedures and left them in a box placed at the waiting room exit.

Procedures

Cystoscopy

All procedures were performed in an outpatient setting by urologists assisted by dedicated nurses. During their initial consultation, patients received an information pamphlet produced

by the Canadian Urological Association (CUA) detailing the procedures. Men were placed in a standard decubitus position while women were placed in a dorsolithotomy position. Flexible (16 Fr) or rigid (17 Fr, 70°) cystoscopes were used in men and women, respectively. No topical urethral anesthesia was administered in our patient cohort, as in our routine practice. Cystoscopes were inserted in the urethra under direct vision for systematic exploration of the entire bladder cavity.

UDS

All UDSs were performed in an outpatient setting by trained, dedicated nurses. During their initial consultation, patients received a CUA-produced information pamphlet detailing the procedure. Free uroflowmetry was followed by clean catheterization (male 16 Fr, female 14 Fr). Both men and women were placed in a dorsolithotomy position for the insertion of recording transducers and then seated for the remainder of the study. The urethral catheter (dual lumen 7 Fr, Laborie Medical ULC, Mississauga, ON, Canada) was introduced first, after application of a non-anesthetic lubricating gel, and two electrodes (Neotrode® II, ConMed Corporation, Utica, NY, U.S.) were positioned close to the anal area, at three hours and nine hours, respectively. The rectal catheter (abdominal pressure 9 Fr, Laborie Medical ULC) was then introduced into the rectum, and the balloon was filled with 3 cc of water. A room-temperature saline solution was infused at a constant rate of 50 cc/minute with an Aquarius II UDS station (Laborie Medical ULC). Cystometrograms, Valsalva leak point pressure (VLPP), pressure flow study with electromyogram (EMG) and post-void residual (PVR) were recorded, tailored to the reason for the test. To assess VLPP, the bladder was filled a second time until the first sensation of bladder-filling occurred. The urethral catheter was removed and the patient was asked to strain in seated and standing positions. The electrodes and rectal catheter were finally removed at the end of the procedure.

Questionnaires

Two anonymous, auto-administered questionnaires, specifically developed in our department, were built with different types of responses, including open answers, multiple-choice questions, and 0–10 numerical rating scales (NRS). They were available in both English and French, depending on patient preference. Each was designed to successively collect basic epidemiological data and medical history, evaluating the quality of information provided, and assessing the prevalence and level of anxiety, pain, and embarrassment experienced before and/or during the procedures. The questionnaires were considered for final analysis only if completed in their entirety.

Statistical analysis

Descriptive results were reported as absolute values (n) and percentages (%) for categorical variables and as mean \pm standard deviation (SD) for discrete variables. Statistical analysis was built to identify underlying factors that could have influenced anxiety, pain, and/or embarrassment, including gender, age, repeat procedures, and quality of information provided, as well as correlations between anxiety, pain, and embarrassment. Univariate analyses with the two-sided Mann-Whitney U test (discrete variables, two groups), the Kruskal-Wallis test (discrete variables, >2 groups), and Fisher's exact test (categorical variables) were conducted with IBM SPSS statistics, version 21.0 (IBM Corporation, Armonk, NY, U.S.). Multivariate analyses were finally performed with multiple linear models. The prevalence of anxiety, pain, and embarrassment, as well as related levels of intensity, were successively considered as dependent variables, and only independent variables associated with $p < 0.3$ in univariate analysis were tested. Statistical significance was set at $p < 0.05$.

Results

Patients' characteristics (Table 1)

In total, 101 patients were included in cystoscopy analysis. Ninety-one patients (90.1%) said they had received complete information regarding diagnostic cystoscopy before the procedure, and 98 (97.0%) accepted to subsequently undergo repeat cystoscopy if medically indicated. Females were significantly more likely to undergo a first cystoscopy at questionnaire time (45.7% vs. 16.7%; $p = 0.004$).

A total of 185 patients were included in UDS analysis. Males had significantly higher mean body mass index than females (29.5 vs. 26.9; $p < 0.001$). Overall, 113 patients (61.1%) said they had received complete information on UDS before the procedure, and 172 patients (93.0%) accepted repeat UDS if needed.

Anxiety (Table 2)

Multivariate analysis showed that anxiety, pain, and embarrassment were statistically correlated with each other during cystoscopy and UDS (Supplementary Table 1; available at www.cuaj.ca). Fifty-nine patients (58.4%) reported having experienced a certain degree of anxiety before cystoscopy, with a mean anxiety level of 2.8 ± 3.0 . Multivariate analysis of the cystoscopy group revealed that the percentage of patients reporting anxiety was significantly higher in younger patients (18–50 years old) (93.7% vs. 51.8%; $p = 0.045$), as well as in patients who received information beforehand

Table 1. Patient characteristics at cystoscopy and UDS

Cystoscopy – Patient characteristics				
	Overall n=101	Males n=66	Females n=35	p
Age, mean ± SD	64 ± 14.4	66 ± 15.2	61 ± 12.2	0.034
BMI mean ± SD	26 ± 4.9	27 ± 5.1	26 ± 4.6	0.220
First-time cystoscopy, n (%)	27 (26.7)	11 (16.7)	16 (45.7)	0.004
Symptoms, n (%)				
Overactive bladder	17 (16.8)	7 (15.2)	10 (28.6)	0.028
Urge incontinence	11 (10.9)	4 (6.1)	7 (20.0)	0.045
Recurrent UTI	13 (12.9)	6 (9.1)	7 (20.0)	0.132
Bladder pain	3 (3.0)	0 (0.0)	3 (8.6)	0.039
Hematuria	34 (33.7)	23 (34.8)	11 (31.4)	0.826
Followup	21 (20.8)	15 (22.7)	6 (17.1)	0.611
Other	16 (15.8)	13 (19.7)	3 (8.6)	0.166
Information,* n (%)	91 (90.1)	61 (92.4)	30 (85.7)	0.309
Willing to undergo another cystoscopy, n (%)	98 (97.0)	64 (96.9)	34 (97.1)	1.000
UDS – Patient characteristics				
	Overall n=185	Males n=68	Females n=117	p
Age, mean ± SD	57.9 ± 15.4	61.2 ± 15.1	56.0 ± 15.2	0.073
BMI, mean ± SD	27.8 ± 7.9	29.5 ± 6.1	26.9 ± 8.7	<0.001
First-time UDS, n (%)	130 (70.3)	46 (67.6)	84 (71.8)	0.618
Symptoms, n (%)				
Overactive bladder	85 (45.9)	28 (41.2)	57 (48.7)	0.360
Urge incontinence	44 (23.8)	13 (19.2)	31 (26.5)	0.287
Stress incontinence	62 (33.5)	15 (22.1)	47 (40.2)	0.015
Urinary retention	25 (13.0)	16 (23.5)	9 (7.7)	0.003
Bladder pain	27 (14.6)	6 (8.8)	21 (17.9)	0.130
Followup	21 (11.4)	8 (11.8)	13 (11.1)	1.000
Other	15 (8.1)	5 (7.4)	10 (8.5)	1.000
Information,* n (%)	113 (61.1)	43 (63.2)	70 (59.8)	0.755
Willing to undergo another UDS, n (%)	172 (93.0)	62 (91.2)	110 (94.0)	0.554

*Patients reported having received information before the procedure. BMI: body mass index; SD: standard deviation; UDS: urodynamic study; UTI: urinary tract infection.

(62.6% vs. 20.0%; $p=0.009$). Seventy-seven patients (41.6%) reported anxiety before UDS, with mean anxiety level of 2.2 ± 3.1 .

Pain (Table 3)

Sixty patients (59.4%) reported pain during cystoscopy, with mean pain levels of 0.7 ± 2.1 , 2.8 ± 3.1 , and 1.4 ± 2.6 at the time of examination table installation, cystoscope insertion, and removal, respectively. One hundred eleven patients (60.0%) experienced pain during UDS, with mean pain levels of 0.7 ± 1.8 , 3.0 ± 3.1 , 1.4 ± 2.2 , and 1.3 ± 2.2 at examination table installation, urethral catheter insertion, rectal catheter insertion, and micturition, respectively. On multivariate analysis, males (73.5% vs. 52.1%; $p=0.004$) were significantly more likely to report pain during UDS, and age was found to

be correlated with pain experience ($p<0.001$) (Supplementary Table 2; available at www.cuaj.ca). Pain level at the time of examination table installation was significantly higher in patients undergoing repeat UDS (1.0 vs. 0.5; $p=0.014$), while pain level at the time of micturition was significantly higher in males (1.9 vs. 1.0; $p<0.001$) and younger patients (18–60 years old) (2.0 vs. 0.7; $p=0.043$).

Embarrassment (Table 4)

Twenty-two patients (21.8%) reported that they experienced embarrassment during cystoscopy, with mean embarrassment levels of 1.0 ± 2.5 , 0.9 ± 2.3 , and 0.1 ± 1.1 at examination table installation, cystoscope introduction, and removal, respectively. On multivariate analysis (Supplementary Table 1; available at www.cuaj.ca), embarrassment was significantly more frequent in younger patients during cystoscopy (43.7% vs. 17.6%; $p=0.026$). Sixty-four patients (34.6%) experienced embarrassment during UDS, with mean embarrassment levels of 0.8 ± 2.0 , 1.6 ± 2.8 , 1.4 ± 2.6 , and 1.2 ± 2.6 at examination table installation, urethral catheter insertion, rectal catheter insertion, and micturition, respectively.

Discussion

The present study discerned good overall tolerance of invasive urological diagnostic procedures, with 97.0% and 93.0% of patients willing to undergo repeat cystoscopy or UDS if medically indicated. These results are in accordance with previous publications. Anxiety, pain, and embarrassment reported before and during these invasive diagnostic urological procedures were highly correlated. Such a tangle between apprehension, painful sensation, and discomfort has already been described in the literature,^{10,11} and several authors have demonstrated that patients systematically anticipated more pain than they actually experienced.^{3,5,12}

In the present study, multivariate analysis divulged an increased proportion of patients with anxiety before cystoscopy in the younger population (18–50 years old). Such

Table 2. Anxiety experienced before cystoscopy and UDS – Univariate analysis

Cystoscopy – Anxiety before procedure				
	n (%)	p	Level (mean ± SD)	p
Overall (n=101)	59 (58.4)		2.8 ± 3.0	
Male (n=66)	40 (60.6)	0.672	2.9 ± 3.1	0.588
Female (n=35)	19 (54.3)		2.6 ± 2.9	
Age, years				
18–50 (n=16)	15 (93.7%)		4.8 ± 2.6	
51–60 (n=19)	9 (47.4%)		2.4 ± 3.4	
61–70 (n=29)	15 (51.7%)	0.019*	2.9 ± 3.2	0.038*
71–80 (n=26)	15 (57.7%)		2.2 ± 2.5	
>80 (n=11)	5 (45.5%)		2.1 ± 2.6	
First-time cystoscopy (n=27)	18 (66.7%)	0.366	3.6 ± 3.2	0.130
Repeat cystoscopy (n=74)	41 (55.4%)		2.5 ± 2.9	
Information (n=91)	57 (62.6%)	0.015*	3.0 ± 3.0	0.053
No information (n=10)	2 (20.0%)		1.3 ± 2.8	
Pain (n=59)	43 (72.9%)	0.001*	3.8 ± 3.2	<0.001*
No pain (n= 42)	16 (38.1%)		1.4 ± 2.1	
Embarrassment (n= 22)	17 (77.3%)	0.052	4.2 ± 3.3	0.026*
No embarrassment (n= 79)	42 (53.2%)		2.4 ± 2.8	
UDS – Anxiety before procedure				
	n (%)	p	Level (mean ± SD)	p
Overall (n=185)	77 (41.6)		2.2 ± 3.1	
Males (n=68)	28 (41.2)	1.000	2.2 ± 3.2	0.895
Females (n=117)	49 (41.9)		2.1 ± 3.0	
Age, years				
18–50 (n=58)	26 (44.8)		2.2 ± 3.0	
51–60 (n=40)	21 (52.5)		3.0 ± 3.6	
61–70 (n=47)	17(36.2)	0.353	1.8 ± 2.8	0.316
71–80 (n=30)	9 (30.0)		1.3 ± 2.6	
>80 (n=10)	4 (40.0)		2.4 ± 3.7	
First-time UDS (n=129)	57 (44.2)	0.254	2.2 ± 3.1	0.237
Repeat UDS (n=56)	20 (35.7)		1.8 ± 2.8	
Information (n=113)	45 (39.8)	0.545	2.1 ± 3.0	0.560
No information (n=72)	32 (44.4)		2.3 ± 3.1	
Pain (n=111)	55 (49.5)	0.010*	2.6 ± 3.2	0.007*
No pain (n=74)	22 (29.7)		1.4 ± 2.6	
Embarrassment (n= 64)	36 (56.2)	0.005*	3.0 ± 3.3	0.002*
No embarrassment (n= 121)	41 (33.9)		1.7 ± 2.8	

*Significant correlations (p<0.05); n: number of patients experiencing anxiety before the procedure; level: level of anxiety on numerical rating scale before the procedure; information: patients reported having received information before the procedure. SD: standard deviation; UDS: urodynamic study.

a correlation has already been demonstrated by Yiou et al in patients undergoing UDS.¹ Furthermore, patients who received complete information before cystoscopy were more likely to experience anxiety. Although not reported previously, this is clearly supported by Greenstein et al, who evaluated the effect of routine explanation provided to men for their expectation of pain associated with UDS, and reported that explanation by a urologist significantly increased pain from a mean level of 4.2 to 5.17.¹²

age and embarrassment during cystoscopy.

Because anxiety, pain, and embarrassment associated with cystoscopy and UDS have been reported repeatedly to correlate with each other,^{3,9-12} we presume they should logically be taken into account and prevented through an integrated and comprehensive approach. Many strategies have been studied to relieve pain during such procedures, particularly cystoscopy, including pain lubricants, topical anesthetics,¹⁵ flexible cystoscopes, pre-emptive non-steroidal

In the current literature, some factors have already been demonstrated to influence pain perception during cystoscopy, including gender,² age,¹¹ and, more controversially, history of previous procedure.^{2,5,13,14} In the present study, however, gender, age, and history of previous procedure were not statistically correlated with pain perception. We assume that the absence of differences between genders could be partly explained by cystoscope type (flexible in men vs. rigid in women). Regarding UDS, several authors have linked male gender⁸ and young age⁶ with increased pain levels at UDS time (i.e., first vs. subsequent procedures). We reported similar results with multivariate analysis, observing that first-time UDS was statistically correlated with decreased pain level at examination table installation. As this pain reduction has more to do with apprehension than perception of a really painful sensation, we think that repeat UDSs can significantly increase anxiety.

Some authors reported, after univariate analysis, that women and young patients experienced significantly high embarrassment levels when undergoing cystoscopy or UDS.^{1,8} However, in the present study, multivariate analysis only demonstrated statistical correlation between

Table 3. Pain experienced during cystoscopy and UDS – Univariate analysis

Cystoscopy – Pain during procedure									
	n (%)	p	Table (mean ± SD)	p	Insertion (mean ± SD)	p	Removal (mean ± SD)	p	
Overall (n=101)	60 (59.4)		0.7 ± 2.1		2.8 ± 3.1		1.4 ± 2.6		
Males (n=66)	42 (63.7)	0.203	0.4 ± 1.6	0.172	2.8 ± 3.0	0.744	1.4 ± 2.3	0.542	
Females (n=35)	18 (51.4)		1.1 ± 2.8		2.8 ± 3.5		1.5 ± 3.1		
Age, years									
18–50 (n=16)	11 (68.8)		0.5 ± 2.0		3.5 ± 3.1		2.2 ± 3.2		
51–60 (n=19)	9 (47.4)		0.7 ± 1.7		2.3 ± 3.2		1.4 ± 2.1		
61–70 (n=29)	19 (65.5)	0.560	1.1 ± 2.8	0.389	3.3 ± 3.6	0.340	2.0 ± 3.1	0.114	
71–80 (n=26)	15 (57.7)		0.5 ± 2.1		2.7 ± 2.9		0.9 ± 2.2		
>80 (n=11)	5 (45.5)		0.1 ± 0.3		1.2 ± 1.5		0.2 ± 0.6		
First-time cystoscopy (n=27)	17 (63.0)	0.652	0.4 ± 1.3	0.969	2.7 ± 3.1	0.994	1.4 ± 2.3	0.551	
Repeat cystoscopy (n=74)	43 (58.1)		0.9 ± 2.4		3.1 ± 3.2		1.6 ± 2.8		
Information (n=91)	54 (59.3)	1.000	0.6 ± 2.0	0.514	2.8 ± 3.1	0.795	1.4 ± 2.5	0.516	
No information (n=10)	6 (60.0)		1.3 ± 3.2		2.7 ± 3.6		1.6 ± 3.5		
Anxiety (n=59)	43 (72.9)	0.001*	0.7 ± 2.3	0.959	3.7 ± 3.2	<0.001*	1.8 ± 2.8	0.022*	
No anxiety (n=42)	16 (38.1)		0.6 ± 1.9		1.5 ± 2.5		0.9 ± 2.2		
Embarrassment (n=22)	18 (81.8)	0.014*	2.0 ± 3.7	0.004*	4.6 ± 3.6	0.003*	3.6 ± 3.7	<0.001*	
No embarrassment (n=79)	41 (51.9)		0.3 ± 1.1		2.3 ± 2.8		0.8 ± 1.8		

UDS – Pain during procedure										
	n (%)	p	Table (mean ± SD)	p	Urethral (mean ± SD)	p	Rectal (mean ± SD)	p	Mict (mean ± SD)	p
Overall (n=185)	111 (59.4)		0.7 ± 1.8		3.0 ± 3.1		1.4 ± 2.2		1.3 ± 2.2	
Males (n=68)	50 (73.5)	0.005*	0.9 ± 2.1	0.169	3.8 ± 3.2	0.005*	1.4 ± 2.1	0.578	1.9 ± 2.5	0.007*
Females (n=117)	61 (52.1)		0.5 ± 1.5		2.5 ± 3.0		1.4 ± 2.2		1.0 ± 1.9	
Age, years										
18–50 (n=58)	41 (72.4)		0.8 ± 2.2		3.6 ± 3.1		1.9 ± 2.4		1.7 ± 2.6	
51–60 (n=40)	31 (77.5)		0.8 ± 1.6		3.8 ± 3.3		1.8 ± 2.6		2.3 ± 2.6	
61–70 (n=47)	25 (53.2)	<0.001*	0.6 ± 1.4	0.333	2.7 ± 3.0	0.003*	0.8 ± 1.3	0.027*	0.7 ± 1.2	<0.001*
71–80 (n=30)	7 (23.3)		0.4 ± 1.7		1.3 ± 2.4		1.1 ± 2.3		0.6 ± 1.8	
>80 (n=10)	7 (70.0)		0.6 ± 1.6		2.9 ± 3.4		0.9 ± 1.0		0.6 ± 0.8	
First-time UDS (n=129)	81 (62.8%)	0.194	0.5 ± 1.6	0.019*	3.1 ± 3.1	0.318	1.4 ± 2.2	0.670	1.4 ± 2.3	0.614
Repeat UDS (n=56)	30 (53.6%)		1.0 ± 2.0		2.8 ± 3.1		1.4 ± 2.1		1.3 ± 1.9	
Information (n=113)	68 (60.2%)	1.000	0.7 ± 1.8	0.839	3.1 ± 3.2	0.570	1.6 ± 2.3	0.102	1.7 ± 2.4	0.034*
No information (n=72)	43 (59.7%)		0.6 ± 1.7		2.8 ± 3.0		1.1 ± 1.9		0.9 ± 1.7	
Anxiety (n=77)	55 (71.4%)	0.010*	0.9 ± 2.0	0.101	4.0 ± 3.3	0.001*	1.9 ± 2.4	0.005*	1.9 ± 2.5	0.002*
No anxiety (n=108)	56 (51.9%)		0.5 ± 1.5		2.3 ± 2.8		1.1 ± 2.0		1.0 ± 1.9	
Embarrassment (n=64)	47 (73.4%)	0.007*	1.0 ± 2.2	0.102	4.0 ± 3.4	0.004*	1.8 ± 2.5	0.088	1.9 ± 2.7	0.035*
No embarrassment (n=121)	64 (52.9%)		0.5 ± 1.5		2.5 ± 2.9		1.2 ± 1.9		1.1 ± 1.2	

*Significant correlations (p<0.05); n: number and percentage of patients experiencing pain during the procedure; table: level of pain on numerical rating scale at the time of positioning on examination table; insertion: level of pain on numerical rating scale at the time of cystoscope insertion; removal: level of pain on numerical rating scale at the time of cystoscope removal; urethral: level of pain on numerical rating scale at the time of urethral catheter insertion; rectal: level of pain on numerical rating scale at the time of rectal catheter insertion; mict: level of pain on numerical rating scale at the time of micturition; information: patients reported having received information before the procedure. SD: standard deviation; UDS: urodynamic study.

anti-inflammatory drugs,¹⁶ nitrous oxide inhalation,¹⁷ high irrigation pressure regimens,^{18,19} relaxing music,^{20,21} real-time cystoscopy visualization,²²⁻²⁴ and even virtual reality distraction.²⁵ However, more simply, we believe that the quality of medical information provided could play a major role in patient perceptions of anxiety, pain, or embarrassment and should be considered as a fundamental issue. Indeed, although comprehensive explanation of the pro-

cedure is crucial, it has been demonstrated to significantly increase anxiety,¹² and probably augments pain and embarrassment if not delivered optimally.

Type of vocabulary, such as avoiding pain-related words,^{26,27} clarity more than amount of information provided,²⁸ and standard written information forms²⁹ have been reported to decrease anxiety and/or pain during diverse invasive procedures. Furthermore, it has been proposed that

Table 4. Embarrassment experienced during cystoscopy and UDS – Univariate analysis

Cystoscopy – Embarrassment during procedure										
	n (%)	P	Table (mean ± SD)	P	Insertion (mean ± SD)	P	Removal (mean ± SD)	P	P	
Overall (n=101)	22 (21.8%)		1.0 ± 2.5		0.9 ± 2.3		0.1 ± 1.1			
Males (n=66)	14 (21.2%)	1.000	0.9 ± 2.2	0.680	0.6 ± 1.6	0.445	0.1 ± 0.5	0.636		
Females (n=35)	8 (22.9%)		1.1 ± 2.9		1.5 ± 3.2		0.3 ± 1.7			
Age, years										
18–50 (n=16)	7 (43.7%)		1.4 ± 2.3		1.5 ± 2.7		0.3 ± 1.0			
51–60 (n=19)	3 (15.8%)		0.6 ± 1.9		0.4 ± 1.1		0.0 ± 0.0			
61–70 (n=29)	8 (27.6%)	0.109	1.3 ± 3.0	0.319	1.1 ± 2.6	0.270	0.0 ± 0.0	0.540		
71–80 (n=26)	3 (11.5%)		0.8 ± 2.7		1.0 ± 2.8		0.4 ± 2.0			
>80 (n=11)	1 (9.1%)		0.4 ± 1.2		0.2 ± 0.6		0.0 ± 0.0			
First-time cystoscopy (n=27)	8 (29.6%)	0.281	1.4 ± 2.7	0.198	1.0 ± 2.2	0.408	0.5 ± 2.0	0.019		
Repeat cystoscopy (n=74)	14 (18.9%)		0.8 ± 2.4		0.9 ± 2.4		0.0 ± 0.0			
Information (n=91)	20 (22.0%)	1.000	0.9 ± 2.4	0.778	0.9 ± 2.3	0.492	0.2 ± 1.1	0.638		
No information (n=10)	2 (20.0%)		1.4 ± 3.3		1.0 ± 3.2		0.0 ± 0.0			
Anxiety (n=59)	17 (28.8%)	0.052	1.2 ± 2.7	0.083	1.2 ± 2.6	0.038*	1.4 ± 0.2	0.230		
No anxiety (n=42)	5 (11.9%)		0.6 ± 2.1		0.5 ± 1.8		0.0 ± 0.0			
Pain (n=59)	18 (42.4%)	0.014*	1.4 ± 2.9	0.056	1.3 ± 2.9	0.030*	0.2 ± 1.4	0.230		
No pain (n=42)	4 (9.5%)		0.4 ± 1.4		0.3 ± 1.0		0.0 ± 0.0			
UDS – Embarrassment during procedure										
	n (%)	P	Table (mean ± SD)	P	Urethral (mean ± SD)	P	Rectal (mean ± SD)	P	Mict (mean ± SD)	P
Overall (n=185)	64 (34.6%)		0.8 ± 2.0		1.6 ± 2.8		1.4 ± 2.6		1.2 ± 2.6	
Males (n=68)	20 (29.4%)	0.268	0.6 ± 1.8	0.192	1.6 ± 3.0	0.544	1.0 ± 2.4	0.088	0.7 ± 2.1	0.068
Females (n=117)	44 (37.6%)		0.9 ± 2.1		1.6 ± 2.7		1.4 ± 2.8			
Age, years										
18–50 (n=58)	20 (34.5%)		0.8 ± 2.2		1.8 ± 3.0		1.6 ± 2.8		1.6 ± 2.9	
51–60 (n=40)	15 (37.5%)		1.1 ± 2.5		2.0 ± 3.3		2.0 ± 3.1		1.4 ± 2.8	
61–70 (n=47)	14 (29.8%)	0.925	0.6 ± 1.5	0.868	1.3 ± 2.3	0.721	0.9 ± 2.0	0.296	0.6 ± 2.1	0.108
71–80 (n=30)	11 (36.7%)		0.8 ± 2.1		1.1 ± 2.3		1.0 ± 2.2		0.9 ± 2.5	
>80 (n=10)	4 (40.0%)		0.4 ± 1.3		1.3 ± 3.2		0.8 ± 2.5		0.8 ± 1.6	
First-time UDS (n=129)	46 (35.7%)	0.612	0.9 ± 2.2	0.945	1.7 ± 3.0	0.453	1.4 ± 2.7	0.640	1.2 ± 2.7	0.948
Repeat UDS (n=56)	18 (32.1%)		0.6 ± 1.5		1.2 ± 2.2		1.1 ± 2.2		1.0 ± 2.4	
Information (n=113)	40 (35.4%)	0.874	0.9 ± 2.1	0.271	1.8 ± 2.9	0.162	1.5 ± 2.7	0.299	1.2 ± 2.6	0.598
No information (n=72)	24 (33.4%)		0.6 ± 1.8		1.3 ± 2.7		1.1 ± 2.4		1.1 ± 2.6	
Anxiety (n=77)	36 (46.7%)	0.005*	1.1 ± 2.3	0.004*	2.0 ± 3.1	0.043*	1.8 ± 2.9	0.028*	1.6 ± 2.9	0.028*
No anxiety (n=108)	28 (25.9%)		0.5 ± 1.8		1.3 ± 2.6		1.0 ± 2.3		0.8 ± 2.2	
Pain (n=111)	47 (42.3%)	0.007*	1.1 ± 2.3	0.014*	2.1 ± 3.2	0.002*	1.7 ± 2.8	0.005*	1.5 ± 2.8	0.002*
No pain (n=74)	17 (23.0%)		0.4 ± 1.5		0.8 ± 0.9		0.8 ± 2.1		0.6 ± 2.0	

*Significant correlations ($p < 0.05$); n: number and percentage of patients experiencing embarrassment during the procedure; table: Level of embarrassment on numerical rating scale at the time of positioning on examination table; insertion: level of embarrassment on numerical rating scale at the time of cystoscope insertion; removal: level of embarrassment on numerical rating scale at the time of cystoscope removal; urethral: level of embarrassment on numerical rating scale at the time of urethral catheter insertion; rectal: level of embarrassment on numerical rating scale at the time of rectal catheter insertion; mict: level of embarrassment on numerical rating scale at the time of micturition; information: patients reported having received information before the procedure. SD: standard deviation; UDS: urodynamic study.

communication should be continued throughout the procedure, as patients are awake during cystoscopy and UDS.³⁰ It is also important to point out that patients undergoing repeat procedures usually do not report lower levels of anxiety, pain, or embarrassment, and should also receive complete information with attentive listening.

The present study is, however, limited on several fronts, and the conclusions should be considered with caution. Since

we did not use any local anesthesia during cystoscopies, the present results may be difficult to generalize. Moreover, voluntary participation and retrospective recall of patients represent important biases that should be considered in interpreting our results. Furthermore, the study was not specifically designed to assess the role of information in patient perception, and the quality of information provided was only ascertained through auto-administered questionnaires. Thus, we advocate further

investigations to draw conclusions on the influence of delivered information and communication on anxiety, pain, and embarrassment associated with cystoscopy and UDS.

Conclusion

The present study highlights strong correlations between anxiety, pain, and embarrassment reported by patients before and during cystoscopy or UDS and demonstrates the major impact of gender and age on patient experience. Interestingly, information provided before cystoscopy was demonstrated to have a negative impact on patient perception of anxiety. This association, albeit in accordance with recent publications, should be specifically assessed through further clinical trials.

Competing interests: Dr. Lam has participated in clinical trials for Medtronic and Coloplast. Dr. Campeau has been an advisor and speaker for Astellas and Pfizer; has received payment from Boston Scientific; and has received grants/honoraria from Allergan, Astellas, and Pfizer. Dr. Corcos has been an advisor for Allergan, Astellas, and Pfizer. Dr. Biardeau reports no competing personal or financial interests.

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