

Frequency of Lower Urinary Tract Symptoms with Irritable Bowel Syndrome and Their Associated Factors among Women at Urogynecology and Gastroenterology Clinic

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Abstract

Objective: To determine the lower urinary tract symptoms (LUTS) in females with irritable bowel syndrome (IBS) and to find the effect on their Quality of Life (QoL) using the Bristol Female Lower Urinary Tract Symptoms (BFLUTS) Questionnaire.

Methodology: This study included 140 female patients, 80 as cases with diagnosed IBS by the Rome III criteria while 60 without IBS as controls from Urogynecology clinics among which 45 patients had a stage-II pelvic organ prolapse and 15 patients had idiopathic microscopic hematuria. LUTS were evaluated using BFLUTS Questionnaire.

Results: The two groups did not significantly differ in demographic except a high body mass index (BMI) in the IBS group (p-value 0.002). The IBS group also had a significantly higher frequency of chronic hypertension, interstitial cystitis, and chronic depression (p-value 0.02, 0.03, and 0.03 respectively). There was a high frequency of LUTS symptoms in patients with IBS, frequency (p-value <0.001), urgency urinary incontinence (p-value <0.004), hesitancy (p-value <0.02), straining to void (p-value <0.001) and intermittency (p-value <0.001). Also, IBS significantly affected sexual activity (p-value < 0.001) and quality of life especially, daily tasks (p-value <0.01).

Conclusion: Patients with IBS have a higher frequency of storage and voiding LUTS, and it negatively affects their sexual and overall quality of life. Thus it is possible that both share some common underlying pathology and patients with IBS should be screened for LUTS and provided comprehensive care.

Keywords: Irritable bowel syndrome, quality of life, lower urinary tract symptoms.

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Introduction

IBS is a functional gastrointestinal disorder with symptoms of abdominal pain or bloating with associated altered bowel habits (either diarrhea, constipation, or alternating between both) in the absence of structural or biochemical abnormalities.¹ The exact cause of IBS is unclear. It is a common disorder worldwide however there is significant variance in the regional prevalence rates ranging from 5.8% in the Middle East and Africa to 9.6% in Asia.² The reported prevalence in Asia range from 4.6% (3.7%–5.5%) in Bangladesh to 0.2% (0.1%–0.3%) in India.²

IBS is associated with an increased rate of extra-intestinal symptoms such as LUTS, musculoskeletal pain, neurasthenia, and sleep.³ LUTS consists of storage (stress

urinary incontinence (SUI), urgency urinary incontinence (UUI), increase urinary frequency, nocturia, urgency, and enuresis), voiding (hesitancy, intermittency, straining, terminal dribble, splitting, and slow stream), and post-micturition symptoms.⁴

The association between LUTS and IBS has been investigated in many studies. In 1986, Whorwell et al. showed that as compared to controls, IBS patients have more frequent urinary symptoms.⁵ A meta-analysis has shown a high risk of LUTS in IBS patients.⁶ The most common reported LUTS were storage symptoms with OR=1.80, P<0.0001.

The underlying biologic mechanisms of LUTS in IBS patients are currently unknown. However, the proposed mechanisms include overlapping neural pathways, and smooth muscle dysfunction by shared neurotransmitters.^{7, 8} Both these

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conditions share common associated factors, such as chronic depression/anxiety, arthritis, obesity, previous abdominopelvic

The questionnaire had three parts: part one- demographic features. Part.2 consisted BFLUT- Questionnaire to assess

Variables	Total (n=120) n (%)	IBS group (n=80) n (%)	Non-IBS group (n=60) n (%)	p-value
Age (years)	8 (5.8)	2 (2.5)	6 (10.0)	0.20
21-30	24 (17.3)	10 (12.7)	14 (23.3)	
31-40	56 (40.3)	37 (46.8)	19 (31.7)	
41-50	32 (23.0)	21 (26.6)	11 (18.3)	
51-60	19 (13.7)	9 (11.4)	10 (16.7)	
>60				
BMI (kg/m ²)	28.4±4.1	29.4±4.7	27.2±2.6	0.002*
Parity	11 (7.9)	1 (1.3)	10 (16.7)	0.25
Nulliparous	66 (47.1)	48 (60.0)	18 (30.0)	
1-4	63 (45.0)	31 (38.8)	32 (53.3)	
>4				
Mode of delivery	104 (75.9)	59 (76.6)	45(75.0)	0.82
Spontaneous vaginal delivery Cesarean section	33 (24.1)	18 (23.4)	15 (25.0)	
Prior anterior vaginal repair	1 (0.7)	1 (1.3)	0 (0.0)	1.00
Prior operation for uterine prolapse	2 (1.4)	2 (2.5)	0 (0.0)	0.50
Hormonal status	25 (17.9)	9 (11.3)	16 (26.7)	0.01**
Arthritis	77 (55.0)	48 (60.0)	29 (48.3)	0.17
Asthma	18 (12.9)	11 (13.8)	7 (11.7)	0.71
Hypertension	52 (37.1)	36 (45.0)	16 (26.7)	0.02**
Interstitial cystitis	16 (11.4)	13 (16.3)	3 (5.0)	0.03**
Chronic depression	51 (36.4)	35 (43.8)	16 (26.7)	0.03**
Chronic anxiety	68 (48.6)	36 (45.0)	32 (53.3)	0.32
Diabetes	45(32.1)	31 (38.8)	14 (23.3)	0.05

surgery, diabetes, hypertension, and other psychosomatic illnesses.^{5, 9, 10}

Regional data on this subject is lacking and there is a gap in the literature regarding the association between IBS and LUTS and their associated factors in our population.

We aimed to determine the LUTS in patients with diagnosed IBS. Establishing LUTS in IBS patients can help develop a treatment strategy to comprehensively address the etiology and presentations of bowel and bladder disorders.

Material and Methods

We carried out a case-control study after a written informed consent and consecutively enrolled 80 cases with diagnosed IBS, using Rome III criteria but no organic disease at the Gastroenterology clinic, Aga Khan University Hospital, from January-December 2019. As a control group, 45 women were recruited from the Urogynecology clinics with diagnosed pelvic organ prolapse ≤stage-II or idiopathic microscopic hematuria (15 patients), without diagnosed IBS. All patients with IBS had a detailed physical examination, required blood tests, and flexible sigmoidoscopy when indicated while urinalysis and Uroflowmetry were performed in patients with LUTS.

Exclusion criteria for both the groups were: pregnancy, delivery during the last six months, major psychiatric disorder, lactose intolerance, infectious diarrhea, previous abdominal surgery, incomplete questionnaires, and who did not consent to be part of the study.

urinary symptoms on a four-point scale (never, sometimes, often, weekly, or each time or daily/nightly) using the method described by Brookes et al.¹¹LUTS was defined according to the ICS recommendations.⁵ Part 3 consisted of IBS Rome III criteria Questionnaire. It defines IBS as “recurrent abdominal pain or discomfort for at least 3 days/month during the last 3 months associated with at least two or more of the following features: (1) improvement after defecation; (2) onset associated with a change in frequency of bowel movement; and/or (3) onset associated with a change in form of stools”.

A sample size of 122 was calculated using sample size estimation through repeated measures ANOVA on PASS software version 15, to achieve 80% power to detect a mean difference of 1.6 or more in the total score of the two treatments with 2 repeated measurements having a Compound Symmetry covariance structure when the standard deviation is ranging between 3.8 to 4.2, the correlation between observations on the same subject is 0.250, and the alpha level is 0.050.¹²

Data were analyzed using SPSS version 21. Frequencies were tabulated for categorical data, while mean and SD was calculated for continuous variables. Independent t-test was used to compare means while Chi-square or Fischer-exact tests were used to compare differences between categorized variables. We considered a p-value < 0.05 as significant. Ethical Committee approval of the Aga Khan University was taken for the protocol (ERC-5328-obs-ERC-18)

Results

Nearly half of the patients were between 41-50 years, two-thirds of both the groups delivered vaginally, and episiotomy was done for 68.8% and 60.0% of women in both groups (p -value > 0.05). More women (60.0%) with IBS had a parity of 1-4. Women with IBS had a BMI of 2.2 ± 2.1 kg/m² higher than women without IBS (p -value 0.002). Both groups were different in terms of hormonal therapy, history of hypertension,

Table: II Comparison of storage symptoms using BFLUTS

Variables	IBS group (n=80)n (%)	Non-IBS group (n=60)n (%)	p-value
Nocturia	2.08±2.5	1.86±1.02	0.48
Urgency			0.53
Never	1 (1.3)	1 (1.7)	
Occasionally	28 (35.0)	19 (31.7)	
Most of time	38 (47.5)	27 (45.0)	
All the time	13 (16.3)	13 (21.7)	
Dysuria			0.57
Never	2 (2.5)	2 (0.0)	
Occasionally	15 (18.8)	9 (15.0)	
Most of time	30 (37.5)	27 (45.0)	
All the time	33 (41.3)	24 (40.0)	
Frequency			<0.001*
Every 4 hours or more	1(1.3)	7 (11.7)	
Every 3 hours	13 (16.3)	29 (48.3)	
Every 2 hours	53 (66.3)	24 (40.0)	
Hourly	13 (16.3)	0 (0.0)	
Urgency urinary incontinence (UUI)			0.004*
Never	29 (36.3)	19 (31.7)	
Occasionally	37 (46.3)	40 (66.7)	
Most of time	14 (17.5)	1 (1.7)	
All the time	0 (0.0)	0 (0.0)	
Frequency of UUI		19 (31.7)	0.01*
Never	26 (32.5)	27 (45.0)	
Once or less/week	18 (22.5)	12 (20.0)	
2-3 times/week	14 (17.5)	2 (3.3)	
Once/day	20 (25.0)	0 (0.0)	
Several times a day	2 (2.5)		
Sexual activity	54 (67.5)	60 (100)	<0.001**
Effect on sexual activity	4 (5.0)	19 (31.7)	<0.001*
Not at all	8 (10.0)	27 (45.0)	
A little	18 (22.5)	12 (20.0)	
Some what	50 (62.6)	2 (3.3)	
A lot		0 (0.0)	
Leak during intercourse	0 (0.0)	53 (88.3)	<0.001*
Not at all	21 (26.3)	6 (10.0)	
A little	31 (38.8)	1 (1.7)	
Somewhat	28 (34.1)	0 (0.0)	
A lot			

*, **Significant at p -value < 0.05

* Independent student's t -test was used

**Chi-square test was used

interstitial cystitis, and chronic depression (p -value < 0.05) (Table I)

Table III: Comparison of voiding symptoms using BFLUTS

Variables	IBS group (n=80)n (%)	Non-IBS group (n=60)n (%)	p-value
Hesitancy			0.02*
Never	10 (12.5)	4 (6.7)	
Occasionally	40 (50.0)	20 (33.3)	
Most of time	30 (37.5)	36 (60.0)	
All the time	0 (0.0)	0 (0.0)	
Strain			<0.001*
Never	5 (6.3)	19 (31.7)	
Occasionally	26 (32.5)	38 (63.3)	
Most of time	41 (51.2)	3 (5.0)	
All the time	8 (10.0)	0 (0.0)	
Intermittency			0.001*
Never	9 (11.3)	0 (0.0)	
Occasionally	24 (30.0)	15 (25.0)	
Most of time	38 (47.5)	27 (45.0)	
All the time	9 (11.3)	18 (30.0)	

On BFLUTS, the IBS group had a significant increase in urinary frequency and UUI (p -value < 0.001 and 0.004 respectively), and poor sexual activity than the non-IBS group (p -value < 0.001) (Table II). Voiding symptoms were also significantly affected in IBS group (Table III). On comparing the quality of life, patients with IBS had their daily tasks significantly affected (p -value < 0.01). (Table IV)

Table IV: Comparison of quality of life (QoL)

Variables	IBS group (n=80)n (%)	Non-IBS group (n=60)n (%)	p-value
Change clothes due to urine leakage	11 (13.8)	4 (6.8)	0.36
Never	54 (67.5)	52 (88.1)	
Occasionally	14 (17.5)	3 (5.1)	
Most of time	1 (1.3)	0 (0.0)	
All the time			
Cutting down fluid intake	6 (7.5)	9 (15.0)	0.006*
Never	64 (80.0)	51 (85.0)	
Occasionally	10 (12.5)	0 (0.0)	
Most of time	0 (0.0)	0 (0.0)	
All the time			
Dailytasks effected	0 (0.0)	5 (8.3)	0.01*
Not at all	9 (11.3)	19 (31.7)	
A little	46 (57.5)	27 (45.0)	
Somewhat	25 (31.3)	8 (13.3)	
A lot			
Avoid places without nearby toilet	0 (0.0)	0 (0.0)	0.75
Never	17 (21.3)	21 (35.0)	
Occasionally	58 (72.5)	25 (41.7)	
Most of time	5 (6.3)	14 (23.3)	
All the time			
Interference in life			0.67
Not at all	0 (0.0)	0 (0.0)	
A little	1 (1.3)	0 (0.0)	
Somewhat	16 (20.0)	21 (35.0)	
A lot	62 (78.8)	39 (65.0)	

Discussion

This study revealed that patients with IBS had significantly high scores for urinary frequency, UUI, intermittency, straining to void, and hesitancy on the BFLUTS questionnaire. There was a significant negative impact on their sexual activity and overall QoL.

Similar to the findings of our study, a case-control study of 109 females, showed significantly higher scores for both storage symptoms and total scores using the American Urological Association Symptom Index questionnaire ($P < 0.05$), with a negative effect on their QoL. They also noted a high frequency of psychiatric morbidity in women with IBS than in controls (20% versus 7.2%), mostly correlated with storage LUTS (OR: 1.518; 95% CI: 1.17–1.96; $P < 0.002$).¹³

Another study also revealed similar results. Women with IBS had overall more severe symptoms of LUTS ($p=0.4$), and higher odds of increased frequency [OR; 2.79, 95%CI; 1.37–5.68], urgency (OR 2.68, 95% CI 1.04–6.91), dysuria (OR 3.25, 95% CI 1.06–9.97), and incomplete urinary emptying (OR 2.41, 95% CI 0.85–6.79) during the last 24 hours.¹⁴ A study by Carter et al. compared women with constipation to healthy controls and revealed that the constipated patients were at a high risk of developing LUTS. Similarly, many other studies have also demonstrated association of IBS and LUTS.^{14, 16-19}

Although the exact pathophysiology of symptoms of LUTS in IBS is yet to be established, there are various postulated causes and theories. One of the proposed causes is inflammation of the nerves due to its interaction with mast cells.^{20, 21} The other probable cause is a change in the function of serotonin receptors due to certain signaling and molecular defects in patients with IBS, which ultimately affects the micturition process as serotonin is an important neurotransmitter in GIT and is involved in micturition coordination.²²⁻²⁴

The study had certain strengths. It was prospectively designed, the diagnosis of IBS and LUTS was made using standardized questionnaires.

This study had limitations like the small number of participants and the possibility of selection bias in the control group.

Conclusion

This study reveals that IBS patients have a high frequency of LUTS and must also be evaluated for LUTS also. Both Urogynecologists and Gastroenterologist should work together to define an optimized treatment plan to comprehensively address and manage such patients using innovative approaches.

Recommendations

Future prospective and long-term studies are required to establish the cause of the association between the two conditions and their common factors.

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