

The Correlation between Overactive Bladder Symptoms and Urodynamic Findings in Men and Women

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Abstract

Background: Overactive Bladder (OAB) is defined by the International Continence Society (ICS) as urgency, with or without urge incontinence (UUI), usually with frequency and nocturia, if there is no proven infection or other etiology.

Aim of Study: To evaluate the correlation between overactive bladder symptoms (OAB) and urodynamic Detrusor Overactivity (DO) in non neurogenic bladder in both genders.

Patients and Methods: We reviewed the records of 202 patients who attended Al-Zahra'a Univesity Hospital between October 2013 and October 2018 with overactive bladder symptoms urgency, with or without urge urinary incontinence usually with frequency and nocturia, with presence or absence of DO in two groups. All patients were subjected to: Full history taking, voiding diary, clinical examination, laboratory investigations, radiological investigations, urodynamic studies (UDS) and cystoscopic biopsies for histopathological examination. Also we evaluate OAB symptoms, urodynamic parameters with histopathological findings. All patients underwent uroflowmetry: The maximum flow rate, average flow rate and voided volume were recorded. Post Voiding Residual urine (PVR) volume was recorded. Cystometry: The intravesical, intra-abdominal, detrusor pressure, first desire to void, strong desire to void, Maximum Cystometric Capacity (MCC), total volume infused, bladder compliance and detrusor overactivity were evaluated. Cystoscopy and random bladder biopsies from all patients and stained with Hematoxylin and Eosin for histopathological examination of smooth muscle, the urothelium, lamina propria, and adventitia. We used another special stain Massons trichrome to visualize collagen and degenerative changes of smooth muscle bundles.

Results: Detrusor overactivity DO was diagnosed in (63.36%) 128 OAB patients after urodynamic studies. Of men 42.9% and 36.1% of women with urgency had DO (OAB dry) while 57.1 % of male 63.9% of female patients with urgency and Urge Urinary Incontinence (UUI) were (OAB wet) had DO. Of women 23.8% with no DO were also OAB wet having urodynamic Stress Urinary Incontinence (SUI). Combination of symptoms was more precise in predicting DO in OAB patients. Patchy areas of myohypertrophic and degenerative

histological pattern were observed more in group I in both male and female patients.

Conclusions: We concluded that there was better correlation between OAB symptoms and the urodynamic diagnosis of DO in women than in men, wet OAB more in women than in men in the same group I. Urgency, frequency and UUI in men, nocturia and UUI in women were significantly increased in predicting DO. Combination of objective parameters from the bladder diary, filling cystometry and histopathological findings have a better correlation with the occurrence of DO.

Key Words: *Urodynamic studies – Overactive bladder – Detrusor overactivity – Histopathological finding.*

Introduction

OVERACTIVE Bladder (OAB) is defined by the International Continence Society (ICS) as “urgency, with or without urge incontinence (UUI), usually with frequency and nocturia, if there is no proven infection or other etiology” [1].

Urgency is a sudden compelling desire to pass urine, which is difficult to defer. It is the sine qua non for a diagnosis of OAB [2]. Urgency Urinary Incontinence (UUI): Is defined as involuntary leakage of urine, accompanied or immediately preceded by urgency [3]. Frequent urination and nocturia can be without UUI. As a rule, such patients have sleep disturbances and suffer from depressive and anxiety disorders [4].

Detrusor Overactivity (DO) is a urodynamic observation, characterized by involuntary detrusor contractions during the filling cystometry, which may be spontaneous or provoked. OAB and DO are thus not interchangeable terms, signified by the recognition that OAB patients undergoing urodynamic testing may not have DO (especially continent OAB patients). Conversely DO seen during urodynamic studies may not be associated with any sensation [4]. The presence of DO during

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UDS must be interpreted in the context of patient symptoms and condition. Ideally, patient symptoms should be reproduced during UDS, so DO would be expected to be accompanied by urgency or urgency incontinence, although it can occur and be significant without being symptomatic, particularly in neurogenic DO. This has been reported in 14% to 18% of healthy asymptomatic volunteers undergoing UDS. Conversely, failure to demonstrate DO on UDS does not rule out its existence [5].

The aim of this study is to identify the differences between patients having overactive bladder symptoms with and without detrusor overactivity in non neurogenic bladder in both genders.

Material and Methods

This prospective study included 202 patients (aged ≥ 18 years) with overactive bladder symptoms (urinary urgency with or without UUI and frequency or nocturia) were selected from out-patient's urology clinic, Al-Zahra'a University Hospital between October 2013 and October 2018. Informed consent was signed by all enrolled patients. All patients were subjected to: Full history taking, voiding diary, clinical examination, laboratory investigations, radiological investigations, urodynamic studies and cystoscopic biopsies for histopathological examination.

Those with bladder stones, infection, tumors, irradiation, hematuria, neurological, vesical, bladder outlet and pelvic floor diseases or surgery were excluded.

Patients on antimuscarinic were instructed to stop ingesting them 1 week prior to attending for the test thus providing a washout period and avoiding any interference with test results.

Before urodynamic testing, the patients were instructed to arrive at the urodynamic unit with a comfortably full bladder. All patients underwent uroflowmetry. Maximum flow rate, average flow rate and voided volume were recorded and post voiding residual urine volume (PVR) was recorded using a drainage catheter and measuring container.

After that the patient was placed in the lithotomy position to perform urodynamic testing. Then urodynamic urethral catheter 6Fr dual-lumen and a rectal catheter were inserted under complete aseptic technique as possible. Transducers were equalized and the bladder was filled at a constant rate of 25ml per minute using normal saline solution at room temperature for standard UDS.

The first sensation, second sensation, strong desire to urinate and leakage were recorded during filling phase of cystometry.

The intravesical, intra-abdominal and detrusor pressure. First desire to void, strong desire to void, Maximum Cystometric Capacity (MCC), total volume infused, bladder compliance and detrusor overactivity either spontaneous or provoked by coughing or straining many times if normal cystometry were reported.

After obtaining informed written consent for cystoscopy and biopsy from all patients. Random bladder biopsies were taken using cold-cup biopsy forceps. Biopsies were stained with Hematoxylin and Eosin for histopathological examination of smooth muscle, the urothelium, lamina propria, and adventitia. We used another special stain Masson's trichrome to visualize collagen and degenerative changes of smooth muscle bundles under light microscopy with 400 magnification power.

The results were statically evaluated and analysed using Statal Progam for Social Science (SPSS) for comparison of the finding between DO and no DO patients, and for comparison between OAB symptoms and UDS finding also with histopathological findings. A binary logistic regression modeling selection process was done with DO as the dependant variable and the potential risk factors including symptoms as possible predictor variables. p -value < 0.05 was considered statically significant.

Results

This study was conducted on 202 non-neurogenic patients with a mean age 38.63 ± 13.34 years (range 18-65 years). After urodynamic studies data were collected. We were dividing those OAB patients into two groups. Group I patients with DO were diagnosed in 63.36% OAB patients and Group II patients without DO were diagnosed in 36, 63%. The incidence of DO was 43.75% in male and 56.25% in female OAB patients, respectively with no statistically significant difference between the two groups as regards the age in both genders.

Correlation between OAB reported symptoms and DO of UDS findings in both genders are presented in (Table 1). Urgency, frequency and nocturia were increased with DO in group I more than group II without significant difference while UUI symptom was highly significant increased with DO in group I than group II in both genders.

There were strong relationship between OAB reported symptoms and UDS parameters in both

genders as frequency was highly significant associated with low bladder sensation in male patients and significant low MCC in both genders. While in female patients, nocturia was associated with low bladder sensation with higher significance, and low MCC in male patients with significant difference. Nocturia had significant effect on bladder compliance in both genders. However, UUI was highly significant associated with low bladder sensation and MCC in male and highly significant low bladder sensation in female patients with significant low MCC and significant effect on bladder compliance in (Table 2).

In male, 32 of 56 (57.1%) of male DO patients were OAB wet and 4 of 32 (12.5%) male without DO patients were also wet with highly significant difference. While in female patients, 46 of 72 (63.9%) female DO patients were OAB wet and 10 of 42 (23.8%) female without DO patients were also OAB wet having urodynamic Stress Urinary Incontinence (SUI) with highly significant difference in (Table 3).

There was no significant difference between both genders in the two groups regarding DO and histopathological findings. Normal histopathological findings were low 42.96% in group I compared to 60.81 % in group II in both genders. Myohypertrophic pattern was apparent 57.03% in group I compared with low similar pattern 39.18% in group II. Patchy areas of degenerative pattern were observed in 42.18% in group I while in 31.50% in group II these patterns were observed with no

statistical difference in histopathological findings in (Table 4).

In group I, UUI was the most affecting symptom in morphological changes of urinary bladder; UUI was associated with 79.45% myohypertrophic and 72.23% degenerative changes respectively with significant difference. In group II, nocturia was the most affecting symptom on detrusor muscle in association with 71.11% myohypertrophic and 79.31% degenerative changes respectively without significant difference. Frequency also was affected all parameters of histopathological findings of detrusor muscle in both groups in which myohypertrophic changes with frequency increased up to 71.24% and 62.06% in group I and group II respectively. And degenerative changes increased as 68.52% and 69.56% in group I and group II respectively without statistically difference in (Table 4).

Histopathological changes involving patchy myohypertrophy, patchy degenerations or collagen infiltration of connective tissue might be presented in the same tissue. In group I, patients with myohypertrophic or degenerative changes were associated with low bladder sensation with statistically significant difference and high significant difference in group II. In group I patients' myohypertrophic or degenerative changes were associated with low MCC with high statistical difference compared to group II. Bladder compliance was affected with no statistical difference in the two groups in myohypertrophic or degenerative histopathological patterns in (Table 5).

Table (1): Correlation between overactive bladder symptoms and detrusor overactivity in both genders.

Symptoms	Male (88)		p-value	Female (114)		p-value
	Group I: DO 56	Group II: No DO 32		Group I: DO 72	Group II no DO 42	
<i>Urgency:</i>			0.004*			0.706
Positive	56 (100%)	32 (100%)	1.000	72 (100%)	42 (100%)	1.000
Negative	00	00		00	00	
<i>Frequency:</i>			0.437			0.389
Positive	37 (66.1%)	17 (53.12%)		45 (62.5%)	22 (52.4%)	
Negative	19 (33.9%)	15 (46.88%)		27 (37.5%)	20 (47.6%)	
<i>Nocturia:</i>			0.492			0.042*
Positive	37 (66.1%)	18 (56.3%)		53 (73.6%)	23 (54.8%)	
Negative	19 (33.9%)	14 (43.7%)		19 (26.4%)	19 (45.2%)	
<i>UUI:</i>			<0.001**			<0.001**
Positive	32 (57.1%)	4 (12.5%)		46 (63.9%)	10 (23.8%)	
Negative	24 (42.9%)	28 (87.5%)		26 (36.1%)	32 (70.2%)	

Values are presented as numbers (%).
DO : Detrusor overactivity.
UUI: Urge urinary incontinence.

* p-value <0.05 S.
**p-value <0.001 HS.

Table (2): Association of overactive bladder symptoms and urodynamics findings in men and women patients with OAB.

Symptoms	Male			Female		
	1 st sensation (ml)	MCC (ml)	COMP (ml/cm H2O)	1 st sensation (ml)	MCC (ml)	COMP (ml/cm H2O)
<i>Frequency:</i>						
Positive	91.16±24.61	241.40±65.18	38.93±9.92	117.10±31.62	242.28±65.42	34.64±16.65
Negative	118.15±31.90	285.32±77.04	40.84±13.79	124.11±33.51	292.75±79.04	43.88±26.45
<i>p</i> -value	<0.001**	0.048*	0.314	0.297	0.025*	0.363
<i>Nocturia:</i>						
Positive	105.74±28.55	242.63±65.51	36.21±17.62	119.11±32.16	274.50±74.12	34.09±15.50
Negative	109.69±29.62	286.87±77.45	45.92±11.27	167.40±45.20	310.50±83.84	44.76±20.69
<i>p</i> -value	0.610	0.020*	0.014*	<0.001**	0.083	0.028*
<i>UII:</i>						
Positive	77.55±20.94	200.05±54.01	31.13±12.41	126.66±34.20	256.25±69.19	36.08±17.04
Negative	133.78±36.12	335.68±90.63	48.27±10.74	186.10±66.45	305.80±82.57	52.87±16.17
<i>p</i> -value	<0.001**	<0.001**	<0.001**	<0.001**	0.016*	0.003*
<i>Urgency:</i>						
Positive	109.68±29.61	273.34±73.80	46.86±14.25	119.50±32.27	286.49±77.35	44.72±26.67
Negative	—	—	—	—	—	—
<i>p</i> -value	—	—	—	—	—	—

Values are presented as mean ± SD or numbers (%).

* *p*-value <0.05 S.

UII : Urge urinary incontinenc.

***p*-value <0.001 HS.

MC : Maximum cystometric capacity.

Comp : Bladder compliance.

Table (3): Comparison between wet and dry OAB with detrusor overactivity in both male and female.

	Male	Women
<i>OAB Wet:</i>		
Group I (+DO)	32 (57.1%)	46 (63.9%)
Group II (-DO)	4 (12.5%)	10 (23.8%)
<i>p</i> -value	<0.001**	<0.001**
<i>OAB Dry:</i>		
Group I (+DO)	24 (42.9%)	26 (36.1%)
Group II (-DO)	28 (87.5%)	32 (76.2%)
<i>p</i> -value	<0.001**	<0.001**

Values are presented as numbers (%).

* *p*-value <0.05 S.

OAB wet: Overactive bladder.

***p*-value <0.001 HS

DO : Detrusor overactivity.

Table (4): Correlation between histopathological changes with OAB symptoms in both groups.

All parameters	Group I: DO (n=128)			<i>p</i> -value	Group II: No DO (n=74)			<i>p</i> -value
	Normal (n=55) 42.96%	Hypertrophy (n=73) 57.03%	Degeneration (n=54) 47.18%		Normal (n=45) 60.81%	Hypertrophy (n=29) 39.18%	Degeneration (n=23) 31.08%	
<i>Urgency:</i>								
Positive	(100.0%)	(100.0%)	(100.0%)	1.000	(100.0%)	(100.0%)	(100.0%)	1.000
Negative	0 (0.0%)	0 (0.0%)	0 (0.0%)		0 (0.0%)	0 (0.0%)	0 (0.0%)	
<i>Frequency:</i>								
Positive	35 (63.64%)	52 (71.24%)	37 (68.52%)	0.509	26 (57.77%)	18 (62.06%)	16 (69.56%)	0.802
Negative	20 (36.36%)	21 (28.76%)	17 (31.48%)		19 (42.23%)	11 (37.94%)	7 (30.43%)	
<i>Nocturia:</i>								
Positive	37 (67.27%)	55 (75.35%)	35 (64.81%)	0.099	32 (71.11%)	23 (79.31%)	18 (78.26%)	0.111
Negative	18 (32.73%)	18 (24.65%)	19 (35.19%)		13 (28.89%)	6 (20.69%)	5 (21.74%)	
<i>UII:</i>								
Positive	38 (69.09%)	58 (79.45%)	39 (72.23%)	0.002*	26 (57.77%)	20 (68.96%)	16 (69.56%)	0.174
Negative	17 (30.91%)	15 (20.55%)	15 (27.77%)		19 (42.23%)	9 (31.04%)	7 (30.44%)	

Values are presented as numbers (%).

* *p*-value <0.05 S.

DO: Detrusor overactivity. UII: Urge urinary incontinence.

***p*-value <0.001 HS.

Table (5): Correlation between urodynamic parameters and histopathological findings in both groups.

	Group I: DO (n=128)				Group II: No DO (n=74)			
	Normal	Hypertrophy	Degeneration	P-value	Normal	Hypertrophy	Degeneration	P-value
FS/ml	109.69±29.62	102.74±28.55	91.16±24.61	0.011 *	167.40±45.20	126.66±34.20	117.10±31.62	<0.001 **
MCC/ml	264.87±77.04	200.05±54.01	241.40±65.18	<0.001 **	305.80±82.57	256.25±69.19	272.50±74.12	0.106
Comp ml/H ₂ O	35.57±18.44	30.40±15.71	32/45±34	0.660	43.76±14.22	39.49±7.55	42.12±12.19	0.633

Values are presented as mean ± SD or numbers (%).
 DO : Detrusoroveractivity.
 FS : First sensation.
 MCC : Maximum cystometric capacity.
 Compliance: Bladder compliance.

* p-value <0.05 S.
 **p-value <0.001 HS.

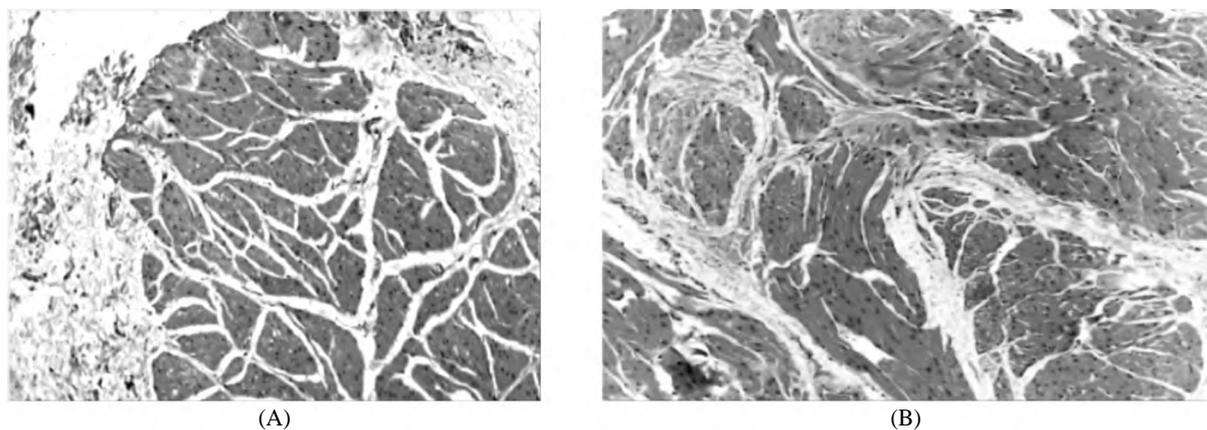


Fig. (1): (A) Normal UB section, muscle layer shows uniform size and arrangement (H & E 200X) comparing to (B) Myohypertrophic sections of UB, increase in size of muscle bundles with areas of fibrocollagen connective tissue in between (H & E 300X).

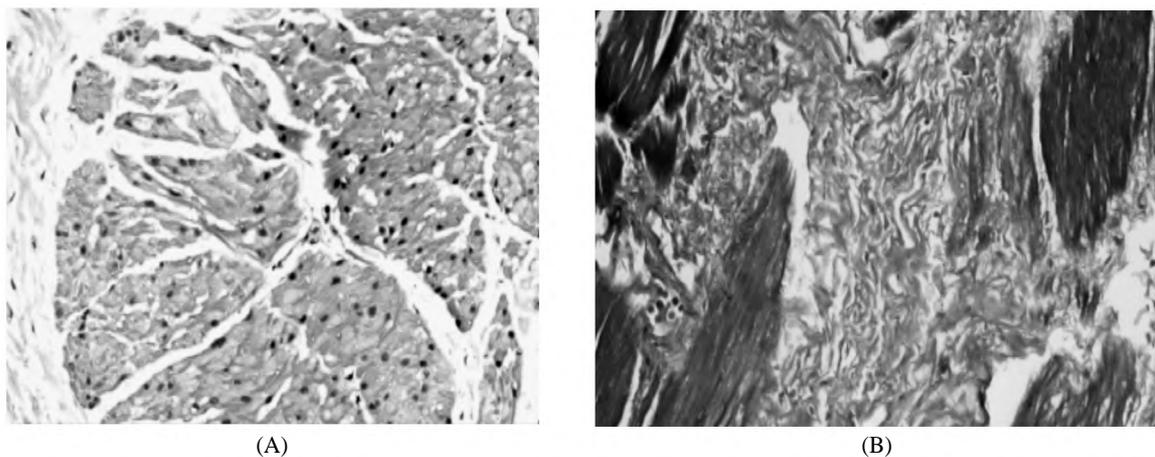


Fig. (2): Degenerative sections of UB, (A) Smooth muscle cells showing variable size and shape with areas of hyaline degeneration and cellular vacuolation (H & E 300). (B) Excess intra and extra cellular fibrocollagen infiltration blue stain (masson's trichrome 400X).

Discussion

Overactive Bladder (OAB) is defined by the ICS as “urgency, with or without urge incontinence, usually with frequency and nocturia, if there is no proven infection or other etiology” [1]. Urodynamic study is not required routinely to make a diagnosis

of OAB, some physicians are concerned that a correct diagnosis will be missed in many patients, and they will not receive appropriate treatment because the bladder has been described as an unreliable witness [6]. The main symptom of this definition is the Urgency symptom, but it is unclear what this is based on [2].

In our study Detrusor Overactivity (DO) was diagnosed in 63.36% OAB patients after urodynamic studies. Similar to study by Digesu GA, et al., 2003, reported that about 55% of patients with OAB symptoms are diagnosed with DO after urodynamic examinations and Y.H. Fan et al., 2011 reported that about 60% of patients with OAB symptoms diagnosed with DO during urodynamic examination [7,8].

In our study after urodynamic studies, the incidence of DO was 43.75% and 56.25% in male and female OAB patients respectively in comparison to Sekido et al., [9] evaluated DO patients 75% and 36, 8% in male and female OAB patients, respectively. This difference was related to population studied.

In comparison to Dekhtiar YM, et al., 2019 reported that 35.8% OAB patients, patients had detrusor overactivity during the whole period of bladder filling as a result of spontaneous detrusor contraction [10].

In our study the incidence frequency in both sexes with DO was 66.1% in male and 62.5% in female respectively without statically difference so frequency was weakly predictive of DO and not significant in associated with urgency and UII in men. Frequency and nocturia were the major affected factors in women in contrast to men. Increasing voiding frequency did not have any effect on increasing the accuracy of diagnosis of DO.

We agree with, Al-Ghazo MA, et al., 2011 who reported that frequency was weakly predictive of DO and not significant associated with urgency, incontinence and nocturia. DO was 75.3% and 57.4% in both male and female patients respectively while interactions with urgency showed that both slightly increase the risk of other factors. In women risks of nocturia 72.2% and incontinence 79.6% were significant and further interactions showed more significant risks, namely the interactions of nocturia with either frequency or incontinence. Although UII was significant associated with DO 66.3% in men, the interactions showed that frequency and nocturia were the major risk factors in women in contrast to men [11].

These results were near to our study; nocturia was increased significantly in female patients with DO 73.6% and in male patients with DO was increased 66.1 % respectively. UII was increased in male and female with DO as 57.1% and 63.9% respectively with highly significant.

This is similar to study by Krystal et al., 2010 who reported that nocturia was considered a valuable predictor of DO as nocturnal DO often occurs in association with nocturia in most patients diagnosed with DO and OAB. Also Hashim and Abrams, 2006 stated that urgency, UII, and nocturia significantly increase the chances of developing DO [12,13].

However, in the study by Y.H. Fan, et al., 2011 found that nocturia alone was a significant predictor of DO, and the probability of presenting with DO increased as the severity of nocturia increased. The reason why this study does not indicate UII as a predictor of developing DO might be due to the high incidence of UII in their patients. Approximately 86.3% of patients were diagnosed with UII, which is significantly higher than the rate of 25% reported in the study performed by Hashim and Abrams. 2006 Previously Khan MS, et al., 2004 reported that UII and nocturia were more associated with DO [8,13,14].

In comparison a study by, Van Brummen HJ, et al., 2004 reported that frequency was a symptom as well as the UII was significantly associated with the presence of DO. So frequency alone was reported to be a poor predictor of DO (31.4%) in female OAB patients, and having urgency, frequency and UII had the highest sensitivity in predicting DO (61.0%) in females [15].

We agree with Chapple CR, et al., 2005 and Hashim and Abrams, 2006 that there is a need for a validated urgency scale that measures urgency rather than bladder sensation [13,16].

Similarly Y.H. Fan et al., 2011. Found that nocturia was a significant predictor of DO, and the probability of presenting with DO increased as the severity of nocturia increased [8].

Similarly, Hashim and Abrams, 2006 reported that UII in men were highly correlated with underlying DO (in 60-90%) compared to women (in 58%) [13].

In our study, there were low bladder sensation, MCC, and bladder compliance, in both genders with OAB with DO with no significant difference.

Similar to study by Y.H. Fan et al., 2011 the bladder volume at the first desire to void and cystometric capacity were lower in both men and women diagnosed with OAB and DO [8].

Also we agree with Dekhtiar YM, et al., 2019 who reported reduced maximum cystometric capacity in 75.9% OAB patients, reduced bladder

sensation in 70.8% patients, and change in bladder compliance in 43.1% patients [10].

In male patients with DO. Frequency and UUI were associated with low bladder sensation and MCC with higher significant difference and in female patients' with DO, UUI and nocturia were associated with low bladder sensation with higher significant difference and low MCC with significant difference.

Al-Ghazo MA, et al., 2011 reported that in men, the urgency and incontinence symptoms were significantly associated with the presence of DO with lower micturition and bladder sensation volumes. In women, only incontinence was significantly associated with DO with a significant effect on all urodynamic parameters examined. However, there is a significant effect of nocturia on bladder compliance while the other parameters did not change significantly [11].

We agree with Chapple CR, et al., [16] reported that each symptom of frequency, nocturia, urgency and incontinence was associated with lower micturition and sensation volumes on filling cystometry. This association was not significant except for each of urgency and incontinence in men and incontinence alone in women. Although urgency is associated with a significant effect on all urodynamic parameters examined in men, there is no significant effect on the occurrence of DO.

Similar to study by Sekido et al., 2006, which reported that the severity of storage symptoms (urgency, frequency, and nocturia) were significantly associated with a reduction in MCC [9].

Guralnick et al., reported that infused volumes were significantly smaller in patients with UDS-proven DO when there was a strong urge to urinate although no differences were noted in the bladder sensation at first desire to void [17].

In our study, 57.1% of male DO patients were OAB wet and 12.5% of male patients with no DO were also wet. 63.9% of female DO patients were OAB wet and 23.8% female patients with no DO were also OAB wet having urodynamic Stress Urinary Incontinence (SUI).

Similar to Al-Ghazo MA, et al., 2011 reported that in male, 44.9% of male DO patients were OAB wet and 10.7% were also OAB wet. In female patients 68.5% were OAB wet, were as 42.1% were also OAB wet. Also, 63% of men and 61.3% of women with urgency (OAB dry) had DO, while 93% of men and 69.8% of women with urgency

and UUI (OAB wet) had DO. However, 58% of women who were OAB wet had Stress Urinary Incontinence (SUI) symptoms with 26.4% having urodynamic stress incontinence [11].

In comparison to Stewart WF, et al., 2003 found that while the prevalence of OAB with and without UUI in women was similar (9.3% and 7.6%) respectively and in men the prevalence of OAB with UUI (2.6%) was much lower than the prevalence of OAB without UUI (13.4%) [18].

In our study myohypertrophic pattern and patchy areas of degenerative pattern were apparent in both sexes with DO more than those without DO with no significant difference.

UUI was the most affecting symptom in morphological changes as myohypertrophic 79.45% and degenerative 72.23% changes respectively increased with statistically significant in patients with DO in group I. Frequency and nocturia were associated with myohypertrophic changes with DO in group I more than group II. And degenerative changes were affected more by nocturia 79.31% in group II without statistically difference.

Elbadwi and associates, 1995 investigated ultrastructural changes of dysfunctional bladders with the electron microscope. Bladder tissue associated with detrusor overactivity exhibited what was termed a dysjunctional ultrastructure pattern. Conversely, a distinctive degenerative pattern has been noted in bladders with overactivity. This pattern is characterized by widespread degeneration of muscle cells and intrinsic nerves of the detrusor. Myohypertrophy ultrastructural pattern has been noted in the bladder with outlet obstruction superimposed on the pattern of overactivity [19].

Charlton RG, et al., 1999 reported the ultrastructural patterns were localized and patchy. A morphometric detrusor overactivity, using light microscopy, found areas of patchy denervation also noted highly 'punctate' structural changes in the density of nerve profiles, muscle cell hypertrophy, and more areas of collagen and elastin infiltration. Perhaps the patchy distribution and changes in the detrusor ultrastructure described in the degenerative and myohypertrophic patterns adjacent to apparently normal areas [20].

Degenerative changes were associated with low bladder sensation with statistically significant difference in group I and high statistically significant difference in group II. Myohypertrophic changes were associated with low MCC more in group I than group II highly significant difference.

True pathological ultrastructural features may be considered as changes to the overall architecture, to the interstitium, the myocyte or to the nature of the cell junctions. In various combinations, these features have been correlated with urodynamically diagnosed voiding disorders.

However in a study by Mastropietro M, et al., 2001 was unable to correlate the ultrastructural patterns that assessed by Elbadawi's 1993 with clinical diagnoses in 24 women. The overall agreement between pattern and diagnosis was only 30%. There were several possible explanations for these negative results. In 35% of patients urodynamic diagnosis was equivocal or difficult, fixation technique was not clearly explained and is acknowledged by the authors as another possible source of discrepancy [21,23].

In comparison to another study performed by Blatt AH, et al., 2012 in bladders from patients with bladder outlet obstruction, variations in muscle cell size and shape, abnormal fascicle arrangement and collagenosis were described, loosely corresponding to the myohypertrophy pattern originally described by Elbadawi et al., 1993 [22,23].

Ultrastructural changes of overactive bladder tissue support this theory of cell-to-cell coupling of background electrical activity. Dysfunction, denervation, and neuroeneration have been shown by Saito et al., 1993 and also in animal models. Mills et al, 2000 demonstrated denervation in 35% of muscle bundles from overactive bladders compared with 1.5% of controls [24,25].

Antunes-Lopes T, et al., 2014 reported that no consensus regarding the relationship between OAB and increased BWT/DWT exists. DWT/BWT was not currently recommended for diagnosis or monitoring of patients [26].

Rachaneni S, et al., 2016 suggested recently published data that routine clinical assessment of BWT for monitoring the effects of OAB/DO treatment is not clinically useful [27].

There were no correlation between bladder wall thickness and predicting DO in our study.

Conclusion:

In conclusion, according to the results of the examination conducted, it was found that most patients with OAB suffer the same types of impairments of the storage function of the bladder, often associated with a decrease in the average effective bladder capacity, frequent urination, presence of urgency urination, and UII events. Definition of

OAB based on urgency is a main better predictor in male and female patients. DO patients had been reduction of the maximum cystometric capacity, reduction of the bladder sensitivity threshold and the reduction of bladder compliance.

Frequency was weakly predictive of DO. Frequency and nocturia were the major affected factors in women in contrast to men. UII highly significant increased in both sexes (63.9% and 57.1%) female and male patients respectively with DO. It is important to inquire about the reproduction of symptoms during UDS and correlate this with findings during the test. There is a need for a validated urgency scale that measures urgency rather than bladder sensation. The pathophysiology of female OAB might be different from that of male OAB. Therefore, treatment outcomes must be evaluated for males and females, separately. Further prospective studies are needed to provide more information about the precise role of urodynamics for men and women with OAB symptoms and more details on structural and histopathological changes of detrusor muscle.

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العلاقة بين أعراض النشاط الزائد للمثانة ونتائج ديناميكية التبول فى الرجال والإناث

النشاط الزائد للمثانة يعرف بأنه عرض يتسم بحتمية والتبول والتكرار المستمر والتبول ليلاً واحتمال اصطحاب سلس بولى مما يؤثر على نمط الحياة فسيولوجياً وقد يحدث النشاط الزائد للمثانة فى حالات متعددة مثل العصبية أو اضطرابات تشريحية بالمثانة أو إلتهابات أو حصوات أو أورام بالمثانة.

ولتشخيص هذا العرض يتطلب عمل فحوصات قبل تشخيصها بالنشاط الزائد بالمثانة مثل أخذ التاريخ المرضى وتحليل بول وأشاعات أو منظار مثانة.

وتوجد إفتراضات متعددة لهذا العرض مثل:

- إختلالات عصبية بالمخ أو جرع المخ أو الاعصاب الطرفية.
- إضرابات بعضلة المثانة.

وقد يحدث أيضاً مع إنسداد فى مجرى البول لفترة طويلة مما يؤدى إلى تضخم بعضلة المثانة أو قلة الاحساس.

وقد أقترح العديد من الاطباء بأن ديناميكية التبول لا تتطلب فى التشخيص المبدئى للعرض.

ونظراً لوجود علاقة قريبة فى نتائج ديناميكية التبول بين النشاط الزائد وإضرابات عضلة المثانة فمن المحتمل فشل العلاج.

المرضى يعانون أكثر عندما يكون النشاط الزائد للمثانة ملازم مع تغيرات ديناميكية التبول وإضرابات عضلة المثانة عن غيرها.

الغرض من البحث تجرى هذه الدراسة لمعرفة الفرق بين المرضى ذوى النشاط الزائد لعضلة المثانة والغير مصاحب باضرابات عضلة المثانة الغير عصبية فى الرجال والإناث.