Original Article

In women with urinary incontinence how necessary is cystometry?

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Abstract

Objectives: To evaluate the role of cystometry in the diagnostic evaluation of patients with symptoms of overactive bladder, by comparing the treatment outcome in those with and without urodynamically proven bladder instability.

Methods: Prospective observational study performed at Urogynaecology Division, the Kidney Center Post-Graduate institute of nephro-urology, Karachi.

Forty six patients with symptoms of overactive bladder i.e. frequency (≥ 8 voids/24 hours), nocturia, urgency with or without urge incontinence, were included. Patients were recruited solely on their symptoms of overactive bladder. All patients, irrespective of the results of cystometry were subsequently treated with oxybutynin 2.5 mg twice daily along with bladder training. Involuntary detrusor contraction over base line during filling are considered significant (AUA Update series). Following variables were compared in those with or without urodynamically proven bladder instability: the bladder volume and amplitude of detrusor contraction at first and maximum detrusor contractions, the treatment outcome and relapse rate The complications of the procedure were noted.

Results: Total number of 46 women, aged between 21-74 years with symptoms of overactive bladder were subjected to cystometry.

The audit of cystometry showed unstable bladder in 17 (36.9%), while rest of the patients 29 (63%) had normal stable bladder with normal emptying. The comparison of treatment outcome in the urodynamically stable and unstable bladder revealed out of 17 unstable bladder with symptoms of OAB in 09 (60%) and 05 (29.4%), a 100% cure rate was observed after 3 and 6 months of treatment respectively. Of the 29 patients with stable bladder and symptoms of OAB, 100% cure rate was achieved in 20 (68.9%) and 06 (20.6%) patients respectively. While in 3 patients in both groups, decrease of symptoms upto 75% after 6 months of treatment was observed. The median volume was less and amplitude of first and maximum detrusor contraction were more in unstable than stable bladder but it was not significant statistically.

Conclusion: Conventional Cystometry showed poor co-relation with Lower urinary tract symptoms (LUT). Both urodynamically proven unstable and stable bladder showed nearly equal improvement with treatment (JPMA 60:356; 2010).

Introduction

The definition currently endorsed for overactive bladder (OAB) by the international continence society (ICS) is that of urgency, with or without urge incontinence with increased daytime frequency and nocturia, in the absence of local or metabolic factors explaining these findings.[1] It is well reported that a significant proportion of patients with symptoms will not have unstable bladder contractions on provocative cystometry. According to ICS, such patients are deemed to have sensory urgency.[2]

OAB is a chronic, highly prevalent and truly bothersome condition. Current estimates suggest it may affect

approximately 17% of the adult population in the US and Europe.[3,4] In the European study- a population based survey in 16,766 individuals across six European countries - approximately 22 million people were estimated to suffer from symptoms of OAB.[4] Two large surveys showed the prevalence of OAB underlining the enormity of the problem.[2] In the National Overactive Bladder Evaluation (NOBLE) programme, which encompassed an additional 5204 adults, a projected 33 million Americans were thought to be affected by OAB. Of these 12 million were incontinent (OAB wet) and 21 million were not (OAB dry).[3]

Milsom I. reported prevalence of overactive bladder varied between 7.7 and 31.3%.[5] In a cohort of women followed from 1991 to 2007 the incidence of OAB was 20%.[5]

The broader symptom complex of OAB is probably more prevalent than asthma (15 million) or heart diseases (21 million), the prevalence approaching that of arthritis (33 million) and chronic sinusitis (37 million).[6]

Despite the high prevalence of OAB, the condition is widely under-diagnosed and underreported. Many of those who suffer from OAB do so in silence. Those who do seek treatment often discontinue, or merely adapt their life styles to cope with their disabilities. The high prevalence of OAB and its debilitating physical and psychological effects clearly justify more targeted efforts towards diagnosis and treatment.

Since 1976, through the influence of the ICS, urodynamics has been promoted as an important, objective aspect of the diagnostic evaluation of patients with such symptoms.[2] However the insistence on reaching a urodynamic diagnosis before treatment, can act as a barrier to therapy in many patients because of need for specialist referral and the cost. Along with the above facts the poor co-relation between Lower urinary tract symptoms and conventional cystometry has been well documented.[7] The co-relation of symptoms of OAB with the urodynamic finding of detrusor instability showed the positive predictive value as 0.56.[8,9] Despite all the above facts, cystometry is still commonly held to be a reliable and objective measure of detrusor function.[10,11]

While considering the above facts and realizing that Urogynaecology as a subspeciality has not been introduced in Pakistan and local data is not available on the subject, the present study was designed to evaluate the role of cystometry in the diagnostic evaluation of patients with symptoms of overactive bladder. The treatment outcome in those with urodynamically proven unstable and stable bladder was compared.

Patients and Methods

Fifty five female patients presented consecutively to urogynaecology clinic with symptoms of OAB e.g. frequency (≥ 8 voids/24 hours), nocturia, urgency with or without urge incontinence were enrolled for the study. Patients were recruited solely on their symptoms of overactive bladder. Results and treatment outcome were evaluated in 46 patients as 09 were lost to follow up.

Exclusion criteria: Total urinary leakage due to fistula, culture proven urinary tract infection, total daily urine volume of > 2.5 litres, altered hepatic or renal function, Diabetes insipidus, patients on any medication other than antidiabetic, patient with haematuria, constipation, or bladder outlet obstruction, renal and vesical stone. Patients with interstitial cystitis, previous history of incontinence and pelvic surgery, spinal surgery and trauma and on anticholinergic therapy were also excluded.

A thorough medical history was taken from all patients and detailed clinical examination was performed with special emphasis on abdominal, per-vaginal and neurological examinations. Timed voiding chart was given to every patient to assess the frequency of passing urine /24 hours and incontinence episode per 24 hours for 3 consecutive days.

All patients were subjected to urine analysis and culture. Ultrasound KUB and post void residual was done to assess any other pathology and amount of post void urine. Uroflowmetry was performed in all patients to exclude Bladder Outlet Obstruction (BOO). After clinical assessment patients were subjected to cystometry. All patients received prophylactic antibiotic (single dose quinolone) before cystometry.

Cystometry was carried out in all patients , a rectal line was maintained and a 7 fr. Double lumen purpose built urodynamic catheter was inserted urethrally. The bladder emptied before the start of the procedure. The transducers were calibrated before each procedure and zeroed to atmospheric pressure. Provocative testing with cough was carried initially to assess correct placement of lines. The bladder was filled at the rate of 35-50 mls/min. Single investigator interpreted all cystometries.

All patients, irrespective of the results of cystometry were subsequently treated with oxybutynin 2.5 mg twice daily along with bladder training. The patients were followed up regularly fortnightly and after 6 months of the completion of the treatment with timed voiding chart for the treatment outcome or any relapse of the symptoms. Average daily frequency and number of incontinence episodes were estimated from timed voiding chart.

Following variables were compared in those with or without urodynamically proven bladder instability: the bladder volume and amplitude of detrusor contraction at first and maximum detrusor contractions, the treatment outcome and relapse rate. The complications of the cystometry were noted.

The first involuntary contraction was defined as that seen at lower bladder volume in any fill void cycle. The maximum contraction was defined as that with the highest

amplitude in any fill cycle.

A 100% cure rate was labeled when frequency decreased to normal <8 during day time and no episode of incontinence. A 75% cure rate was when frequency and incontinence episode decreased to 75% of the base line.

The data was analyzed by SPSS version 10.0.

Results

The mean ages of women were 46.53 ± 11.94 years (range 21-74 years). Among 46 evaluated patients with symptoms of overactive bladder, 17 (36.9%) showed unstable bladder contractions on cystometry and the remainder 29 (63%) did not.

The voiding frequency and number of incontinence episodes were not significantly different in the two groups evaluated by timed voiding chart (Table-1).

Bladder volume and amplitude of detrusor contractions at first and maximum detrusor contraction compared between the two groups are shown in Table-2.

Table-3 shows, the treatment outcome in the two groups. Urodynamically stable bladder showed similar treatment outcome than unstable bladder. Overall, there was similar improvement in frequency and incontinence episodes after the treatment.

Three (20%) patients in unstable and 02 (10.5%) in stable group developed relapse of symptoms after six moths of discontinuation of treatment.

Table-1: Base line voiding diary.

	Stable Bladder N=29	Unstable Bladder N=17
Frequency/24 hours	15	17
Incontinence episode/24 hours	04	04
P= n.s		

Table-2: Results of Cystometry.

	Stable Bladder N=29	Unstable Bladder N=17
First.Detrusor contraction		
Volume ml	388 (399-405)	105 (37-218)
Amplitude cm H2O	11 (16-19)	15 (05-29)
Max.Detrusor contraction		
Volume ml	453 (351-515)	213 (95-423)
Amplitude cm H2O	13 (08-27)	29 (09-41)

Table-3: Treatment out come of the patients with urinary incontinence.

Duration of treatment	Urodynamically Stable Bladder N=29	Urodynamically Unstable Bladder N=17	p-value
A	20 (68.9%)	11 (64.7%)	n.s
B	06 (20.6%)	04 (23.5%)	n.s
C	03 (10.3%)	02 (11.7%)	n.s

A: 100% cure rate after 3 months of treatment:
B: 100% cure rate after 6months of treatment.
C: 75% cure rate after 6 months of treatment.

Discussion

In the last 30 years, cystometry has been established as the gold standard for detailed assessment of Lower Urinary Tract symptoms, particularly Stress Incontinence (SI) and Urinary Incontinence (UI). However the test is invasive, non - physiological and not readily available for a large population.[12]

It has been well documented from the review of literature that only 30-60 % of patients with signs and symptoms of OAB are actually found to have detrusor overactivity at cystometric examination. Our findings show that, cystometry failed to detect nearly 63% of clinically relevant detrusor over activity in women with symptoms of OAB. The result is consistent with that of Helen D et al.[12] The detrusor instability is detected in only 51% of women with urge incontinence by conventional cystometry according to Jarvis et al.[10] Digesu GA showed (54.2%) had urodynamically proven detrusor instability.[13]

In our study the correlation between a detailed urinary symptoms questionnaire and urodynamic finding was only 36.9% for detrusor overactivity same as reported by Bergman et al.[14] Similar findings were also encountered by Webb et al,[15] in 52 patients who were suspected to have detrusor instability on clinical grounds but were stable on conventional cystometry. While Guralnick et al reported 54.1% to have detrusor overactivity on urodynamics.[16]

Helen et al[12] reported first and maximum detrusor contraction at 205 and 328 ml respectively. We found first and maximum detrusor contraction at 105 and 213 ml respectively. Thirteen and twenty six cm H2O were the amplitude of first and maximum detrusor contraction reported by Helen et al.[12] In our study the amplitude of first and maximum detrusor contraction were 15 and 29 cm H2O respectively. Van Brummen et al[17] also found lower volume and higher detrusor contraction for unstable than stable bladder.

In the present study, treatment outcome in the two groups showed that the stable group improved equally well with the treatment. It is consistent with Malon Lee[18] who found both groups had improved equally well with the treatment.

The true value of cystometry is not proven and recently this gold standard test has been some what tarnished by the realization that it may lack sensitivity and specifity particularly in relation to the OAB.[19]

The results of the present study proves that all patients with symptoms of overactive bladder do not necessarily have

urodynamically proven bladder instability, nor does urodynamically proven bladder instability make a difference in the treatment outcome of patients with symptoms of overactive bladder. This is supported by the results of Hashimoto et al.[20] However, a small number of cases is the limitation of the present study.

Conclusion

The clinical history and examination along with timed voiding charts are the reliable diagnostic tools for the effective diagnosis of urinary incontinence. Conventional cystometry showed poor co-relation with LUT symptoms and its finding does not alter the treatment outcome of the patients with symptoms of overactive bladder. Cystometry should only be reserved for those in whom clinical diagnosis is confusing, conservative treatment failed and surgery being contemplated.

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