CYSTOURETHROSCOPY, UROFLOW STUDIES AND POST VOID RESIDUAL URINE TO EVALUATE LOWER URINARY TRACT SYMPTOMS IN CASES OF PELVIC ORGAN PROLAPSE

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ABSTRACT

BACKGROUND

Pelvic organ prolapse is a common gynaecological problem among parous women. Many of them suffer from lower urinary complaints. They undergo a surgery before evaluation of the lower urinary tract complaints and sometimes end up with new complaints. Hence, it is important to evaluate pelvic organ prolapse women with basic urodynamic studies before undertaking corrective prolapse surgery.

The aim of this study is to evaluate hundred cases of pelvic organ prolapse with basic urodynamics studies like cystourethroscopy, uroflow studies and post void residual urine to detect lower urinary symptoms. Many women with pelvic organ prolapse do not complain of urinary symptoms. Post-surgery, they manifest with new urinary complaints. Hence, it is important to evaluate prolapse cases with basic urodynamics before corrective surgery.

MATERIALS AND METHODS

A total of 100 women with pelvic organ prolapse were staged using POP-Q (Pelvic Organ Prolapse Quantification) method and evaluated with uroflow study, post void residual urine and cystourethroscope.

RESULTS

In our study of hundred cases of prolapse, commonest type was stage 4 (61%). The least common type was class 1 (2%). Among these, the commonest urinary complaint was frequency (35%) followed by poor stream (22%). Least common complaint was of urge incontinence and mixed incontinence (1%) and (3%) respectively. Reduced AFR was found in 55% of women of which majority were stage 4. Also, 10% had normal AFR of which 2% were stage 4. QMAX was <15 ml in 44% of women and normal (36 ml) in 29%. Eighty percent of patients had increased post void residual urine with 23% having between 50-150 ml and 57% having less than 150 ml. Normal post void residual urine was found in 20%.
Normal cystourethroscopy findings were found in 95% of women and only 5% had abnormal findings.

CONCLUSION

Uroflow studies and postvoid residual urine were helpful but cystourethroscopy was not. These tests can be used as basic screening tests for women posted for prolapse corrective surgery.

KEYWORDS

Pelvic Organ Prolapse, Urinary Incontinence, Urodynamics, Uroflow Studies, Post Void Residual Urine, Cystourethroscopy.

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BACKGROUND

Pelvic organ prolapse is a condition characterized by prolapse of one or more pelvic organs. When pelvic organs such as bladder, urethra, uterus, vagina, small bowel or rectum move out of their customary position, they can place pressure on other organs or body parts and cause discomfort, pain, urinary incontinence and other undesirable side effects. Worldwide the incidence of pelvic organ prolapse is 11%. Urinary symptoms have a considerable social and economic impact. They impair QOL (Quality of Life) and lead to many social and hygienic problems. It is estimated that 50-80% of multiparous women have some degree of urogenital prolapse and upto 20% of them are symptomatic. About 18-24% of patients with symptomatic prolapse have LUT problems.[1]

The pelvic organ prolapse is known from the time of Hippocrates. Among the studies of Hippocrates reference is made to the fact that displacements of uterus were recognised.[1] The International Continence Society Committee on standardisation of terminology of pelvic organ prolapse and pelvic floor dysfunction has enumerated the various urinary symptoms that are associated with pelvic organ prolapse. These are frequency, dysuria, and urinary retention, voiding difficulties, urinary incontinence and bladder outlet obstruction. These can occur in association with genital prolapse.[2] The term Urodynamics was first coined by D. M. Davis to denote the study of storage and emptying phases of lower urinary tract. Cystourethrography, uroflow studies and PVR urine can be used to assess the

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effects of prolapse on lower urinary tract. These sometimes uncover incontinence in patients who do not complain of that problem. These constitute basic urodynamic studies. These tests can be used to assess effects of prolapse on lower urinary tract before specific treatment (surgery) is initiated. Also to determine what changes can be expected after the surgical correction of prolapse. The embryological and anatomical closeness of lower urinary tract to female genital organs makes it very important to evaluate prolapse cases before surgical treatment is made.

Aims and Objectives

The aim of this study is to evaluate 100 cases of pelvic organ prolapse with Cystourethroscopy, uroflow studies and post void residual urine to detect urinary symptoms. Many women with pelvic organ prolapse do not complain of any urinary symptoms. But post corrective prolapse surgery, they present with new urinary symptoms. Hence, it is important to evaluate them pre-operatively so they can simultaneously undergo all corrective surgeries.

MATERIALS AND METHODS

A total of 100 women with genital prolapse who presented to our tertiary care hospital from May 2014 to April 2015 were selected for our study. A prospective observational study was done. There are many classifications for prolapse. The commonest being POP-Q, Shaw's classification and Baden Walker system. The International Continence Society (1996) has approved the POP-Q staging system. Evaluation of prolapse was done by POP-Q classification in our study. Patients were evaluated in both supine and standing position.

POP-Q classification[3]

Pelvic Organ Prolapse Quantification System (POP-Q)	
Stage	**Description**
0	No prolapse anterior and posterior points are all −3 cm, and C or D is between −TVL and −(TVL−2) cm.
1	The criteria for stage 0 are not met, and the most distal prolapse is more than 1 cm above the level of the hymen (less than −1 cm).
2	The most distal prolapse is between 1 cm above and 1 cm below the hymen (at least one point is −1, 0, or +1).
3	The most distal prolapse is more than 1 cm below the hymen but no further than 2 cm less than TVL.
4	Represents complete procidentia or vault eversion; the most distal prolapse protrudes to at least (TVL−2) cm.
POP-Q Classification	

The POP-Q assessment tool measures nine points in the vagina. The hymen is the reference point to which the other points are compared. The prolapsed organs are measured in centimetres to the hymen. The measurements are taken when the manoeuvre is performed by the woman while in the dorsal lithotomy position. The anatomical landmarks used are anterior vaginal wall, cervix, hymen, perineal body, total vaginal length, posterior vaginal wall and posterior fornix. A three by three-centimetre grid is used to record the proximal and distal numbers. The information on the grid is translated to the appropriate stage of prolapse.

The lower urinary tract evaluation was done by proper history taking, thorough physical examination, urine routine and analysis, urolog or bladder diary and basic urodynamics studies.

Evaluation of patients was done initially by taking proper history. Patients with Diabetes Mellitus, hypertension, neurological dysfunction were excluded. A thorough physical examination was done to rule out any lower abdominal or pelvic abnormality contributing to lower urinary tract symptoms. Urine routine and analysis from a midstream urine sample was performed to exclude infection. The patients were asked to maintain a bladder diary to observe for urinary frequency, nocturia and other LUT symptoms and to measure volume of urine.

The uroflowmetry is a simple and inexpensive test. The normal flow rate from a full bladder is 25-30 ml/second. Obstruction is suspected when flow rate is less than 15 ml/second and definitely when it is less than 10 ml/second. The bladder must contain more than 200 ml (full bladder) to enable detrusor muscle to develop adequate contraction prior to voiding. The flow rate is a product of detrusor action against outlet resistance. The normal flow pattern is a bell-shaped curve.[4]

Then patients underwent uroflowmetry. Here the patient voids into an electronic commode on top of a measuring device that is connected to a transducer. The weight is converted to volume and recorded on a chart in ml/second. Patients are asked to void with full bladder. A time versus flow chart is obtained. The patients were tested with induced prolapse.

There are 2 types of cystourethroscopes- rigid and flexible. The flexible combines the optical system and irrigation channel into a single unit. The optical system consists of a single image bearing fibre optic bundle and 2 light bearing bundles. The optical fibres are fitted into a lens system that magnifies and focuses image. The cable attaches to the telescope at the eyepiece.[4] Patients were subjected to outpatient flexible cystourethroscopy using saline to distend the bladder and urethra. The saline was instilled through a standard intravenous infusion set at a height of 100 cms from the patient to provide adequate flow. A subjective prediction of the architectural support of the bladder base can be made from the cystoscopic view of the base and position of bladder base structure, sphincter deficiency and support of urethrovesical junction.

PVR was measured after voiding with full bladder by using ultrasound.

Volume in ml = H x W x D x 0.7 (0.7 correction because bladder is not circular until full).

RESULTS

Type	N=100	% (N)
Type 1	2	2%
Type 2	9	9%
Type 3	28	28%
Type 4	61	61%
Table 1. Different Types of Prolapse Cases in Our Study		

Highest incidence was of type 3 prolapse.

Type	Frequency	Urgency	S I V	P S	SI	UI	MI
1	1	0	0	1	0	0	0
2	4	0	1	3	1	0	0
3	10	2	5	7	4	0	0
4	20	3	14	11	9	1	3
Total n=100	35	5	20	22	14	1	3
%n	(5%	5%	20%	22%	14%	1%	3%
Table 2. Different Types of Urinary Symptoms in Our Study							

Commonest urinary symptom was frequency in our study.

PVR Urine	N=100	% (N)
<50 ml	20	20%
50-150 ml	23	23%
>150 ml	57	57%
Table 3. Post Void Residual Urine in Our Study		

In our study 80% of patients had increased PVR Urine.

CUS	N=100	% (N)
Normal	95	95%
Abnormal	5	5%
Table 4. Incidence of Abnormal Cystourethroscopic Findings in Our Study		

AFR	Type 1	Type 2	Type 3	Type 4
<10 ml	0	1	14	40
10-15 ml	0	2	6	11
16-35 ml	1	2	5	8
>35 ml	1	4	3	2
Table 5. Incidence of abnormal Uroflow studies with QMAX and AFR				

QMAX	Type 1	Type 2	Type 3	Type 4
<15 ml	0	0	3	41
16-35 ml	1	2	12	12
>36 ml	1	7	13	08
Table 6				

In our study of 100 cases of 100 cases of pelvic organ prolapse, commonest type was stage 4 with 61%. The least common was stage 1 with 2%. Among the prolapse patients, commonest urinary complaint was frequency with 355. Second was poor stream with 22%. Least common complaint was of urge incontinence and mixed incontinence with 1% and 3% respectively.

In our study of 100 cases only 5% had abnormal Cystourethroscopy findings and remaining 95% had none. The abnormal findings include 1 bladder calculi, 4 cases of suspicious bladder neoplasm.

In our study with uroflow, 55% of prolapse women had reduced AFR (55%) of which 40% were stage 4. Ten percent had normal AVF of which only 2% were stage 4. QMAX was 15 ml in 44% of prolapse patients and normal (>36 ml) in 29%.

DISCUSSION

Andrade et al in 2004 showed that in their study stress urinary incontinence was the commonest LUT symptom.[5] Diokno AC, Brocck BM, Brown MB, et al in 1986 showed that in their study mixed urinary incontinence was the commonest.[6] In our study stress incontinence was found in 14% and mixed urinary incontinence in 3%.

Uroflowmetry is a simple and inexpensive test used to evaluate voiding difficulties. In our study 78% had abnormal uroflow patterns with interrupted flow. The normal flow rate from a full bladder is 25-30 ml/second. An obstruction is suspected when the rate is <15 ml /second. The normal flow pattern is a bell-shaped curve. The AFR (Average Flow Rate) of 10 ml/second was taken as abnormal in our study. The QMAX (Maximal Flow Rate) declines with prolapse and was similarly shown in our study. A cut-off of 15 ml/second was taken as abnormal. Reduced AFR and QMAX indicate outflow obstruction.

Carlo Vecchiolli Scaldazza in 2002 showed that prolapse is associated with poor AFR and QMAX.[7] Our study also showed the same. In stress incontinence, the poor support of UV junction due to urethral hypermobility permits descent

and causes funnelling. B. A. Rosenwig in 1992 opined that routine cystourethroscopy in prolapse is not justifiable.[8] In our study also cystourethroscopy was not useful as it could not differentiate different types of LUT symptoms. It can only be used to detect anatomical defects like urethral hypermobility. PVR was high in 80% of our study patients.

In a study by Gill, Edward stated that routine use of pre-operative Cystourethroscopy in the low risk prolapse patients being prepared for surgery is not required.[9] Our study also showed that Cystourethroscopy was not useful.

In 2007, Lucaz E S, in astudy of 1399 women with pelvic organ prolapse 11% had raised PVR. In contrast our study had 79% with abnormal PVR urine.[10] K. W Coates in 1997 in a study of 665 prolapse patients showed a positive correlation between flow rate and voided volume. Women with prolapse had more objective evidence of emptying – phase dysfunction than normal women with no prolapse. This is consistent with the fact that advanced stages of pelvic organ prolapse tend to obstruct urethra particularly during straining.[11]

In a study by Charles W Naga IN 20113, he said that urodynamics studies should supplement the office evaluation of pelvic organ prolapse. The overall benefit of urodynamics is, if it results in changes in diagnosis that result in changes in treatment that result in improvement of outcomes. Until then, it will remain very controversial whether prolapse women will require urodynamics before surgery.[12]

CONCLUSION

Uroflowmetry can itself be a valuable study to evaluate voiding dysfunction. Some patients with prolapse try to void by contracting their abdominal muscles. Such a manoeuvre after surgery may result in closure of urethra and obstruction. Also, with loss of kinking of UV junction after surgery, stress incontinence may manifest postoperatively. Hence uroflowmetry is not only of diagnostic value but also can be used in follow-up studies and deciding on treatment. It gives a permanent graphic record. Cystourethroscopy contributes an anatomic assessment of urethra and bladder and allows discovery of benign and malignant mucosal lesions that may remain undiagnosed by urodynamic alone. It has always been the desire of urologists that PVR urine be the prognostic indicator of bladder function.

In normal voiding, bladder empties by a combination of urethral relaxation and detrusor contraction. Since emptying occurs through a sustained contraction of the bladder musculature which forces the urine out of the urethra, the bladder should be able to empty itself completely even if the urine is forced uphill. In patients with prolapse, this complete voiding does not happen, and they have significant PVR urine. The anatomical closeness of lower urinary system to female genital organs makes it vulnerable to changes with prolapse.

The goal of these tests for evaluation is the accurate characterization of LUT symptoms for the purpose of treatment. These alone cannot provide sufficient data about LUT symptoms and higher evaluation in the form of multichannel urodynamic studies is needed. But cystourethroscopy, uroflow studies and PVR can be used as screening tests for initial evaluation of LUT symptoms in prolapse patients.

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