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CORRELATION OF PATIENT REPORTED OUTCOMES AND URODYNAMIC PARAMETERS WITH FINDINGS ON MAGNETIC RESONANCE IMAGING (MRI) IN ANTERIOR COMPARTMENT PELVIC ORGAN PROLAPSE (POP)

Hypothesis / aims of study
This study aimed to evaluate the relationship between patient reported symptoms of pelvic floor disorders as well as urodynamic data and the pelvic MRI findings in a population of women with anterior compartment POP.

Study design, materials and methods
This study included patients with POP referred for Female Urology outpatient clinic from January 2006 to February 2007. Evaluation included: the Urogenital Distress Inventory questionnaire (UDI), with the addition of 3 questions inquiring about coital incontinence, the need to manipulate vaginal wall to assist voiding, and Dyspareunia. All subjects underwent history and physical examination including pelvic and focused neurological exam to exclude any neurogenic disorder. The extent of prolapse was assessed using the Half way system. Urodynamic study (UDS) was done in a standardized manner including free uroflowmetry, filling and voiding cystometry. Patients with grade II cystocele or more underwent the filling and voiding cystometry with and without prolapse reduction. The UDS data considered for analysis were: Sensory urgency, Motor instability, Compliance, Maximum Cystometric Capacity (MCC), Abdominal Leak Point Pressure (ALPP), Detrusor Leak Point Pressure (DLPP), Qmax, and Obstructed Voiding defined urodynamically as free $Q_{max} \leq 15$ ml/sec and detrusor pressure at maximum flow rate > 20 cmH_2O. The MRI examination was done using 1.5 tesla superconducting magnet (Gyroscan NT 1.5; Philips). Images analysis was done by drawing the pubococcygeal line (PCL) (reference line). The vertical distance from the PCL to the most inferior portion of the bladder represents the extent of cystocele by MRI (descent of the bladder base below PCL). Accordingly, cystocele was graded according to Kelvin et al.[1] into 3 grades: grade I: descent < 3 cm below PCL, grade II: descent 3-6 cm, grade III is descent > 6 cm below PCL. Pearsons and Spearman correlation coefficients were calculated with the SPSS version 11.0; Chicago, IL). Values that are less than 0.5 are considered to be weakly correlated; while values that are greater than 0.5 are considered to be strongly correlated.

Results
Sixty nine patients were included in our study with a mean age of 43.6 years (range: 26 - 65), and mean parity of 5, and mean abortion 2. By physical exam and according to Halfway system: 15 subjects (22%) have grade I cystocele, 27 (39%) have grade II, 16 (23%) have grade III and 11 (16%) subjects have grade IV cystocele. Associated rectocele was found in 62 (90%) subjects, enterocele in 12 cases (17%), uterine descent in 42 cases (60%), and vaginal vault prolapse in 5 cases (7%). According to MRI grading: 33 subjects (48%) have grade I cystocele, 25 subjects (36%) have grade II, while 11 subjects (16%) have grade III cystocele.
The prevalence of urodynamic diagnosis of detrusor instability (DI) and obstructed voiding among our study subjects are 52% and 24%, respectively.
Women reported a variety of symptoms. The frequency of symptoms using the UDI questions and the symptom questionnaire are shown in Tables 1. Of all the UDI symptoms queried, the symptom of ‘‘Vaginal Heaviness’’ was the commonest symptom experienced by patients (60% frequency) which showed positive correlation to the extent of cystocele as measured by physical examination and pelvic MRI. Other symptoms that show positive correlation with the extent of cystocele as measured by both PE and MRI are the need to splint the vaginal wall to assist voiding and feeling of bulging or protrusion in the vaginal area. Symptoms that correlated with extent of cystocele as detected by PE only (but not with MRI) included pain in the pelvis and vaginal area, difficulty of micturition (hesitancy, prolonged and intermittent micturition), and the sense of incomplete bladder evacuation (table I). Of the urodynamic parameters tested, the DLPP and the obstructed voiding pattern positively correlated with the extent of cystocele by MRI. There is negative correlation between demonstration of leak on MRI and patient complaint of pure stress urinary incontinence ($r= -0.469$, $p= 0.005$).

Interpretation of results
We found some correlations between symptoms of cystocele and its extent as measured by physical examination and MRI. The weak inverse relationship between the worsening anterior compartment and stress incontinence may be a result of mechanical obstruction or kinking of the urethra. Our study did not demonstrate any correlation between higher grades of cystocele and irritative voiding symptoms. However, there was weak positive correlation between cystocele defects and bladder compliance as determined by urodynamics (worsening cystoceles were associated with higher DLPP and lesser bladder compliance). Although, the prevalence of urodynamic diagnosis of DI among our study subjects is 52%; there was no correlation between the extent of cystocele and DI. We are aiming at increasing our study population to confirm or deny this specific fact.

Concluding message
Although, symptoms attributed to POP do not necessarily correlate with compartment-specific defects, we found that increasing severity of cystocele is weakly to moderately associated with several specific symptoms and few urodynamic findings. A larger population of patients is needed to confirm the association between worsening cystocele and detrusor instability in those with no associated infravesical obstruction.

	Prevalence	P/E Cystocele Correlation Coefficient (p	MRI Cystocele Correlation Coefficient (p
Patient Reported Symptoms			
1. Frequency	46%		
2. Urgency	54%		
3. Urge incontinence	48%		
4. Stress Incontinence	58%		-0.548 (0.026)
5. Drops of urine leak	42%		
6. Night time urination	29%		
7. Difficulty	33%	0.368 (0.025)	
8. Incomplete	35%	0.347 (0.035)	
9. Pain	58%	0.488¶ (0.002)	
10. Vaginal Heaviness	60%	0.545¶ (.000)	0.429 (.013)
11. Bulge	46%	0.41 (0. 012)	0.350 (.046)
12. Coital incontinence	23%		
13. Splint to void	31%	0.457 (.028)	0.420 (.046)
14. Dyspareunia	27%		
Urodynamic Data			
1. Sensory urge			
2. Motor instability			
3. Compliance			
4. MCC			
5. ALPP			
6. DLPP			0.415 (0.04)
7. Qmax			
8. Obstructed Voiding			0.557 (.009)

Table 1: Frequency of symptoms (1st column) and Correlation of symptoms as reported by subjects with findings on PE (2nd column) and MRI (3rd column). Only statistically significant correlation coefficients are shown [Correlation is significant at the 0.05 level (2-tailed). ¶Correlation is significant at the 0.01 level (2-tailed)]. First 11th symptoms adopted from the UDI, while the last 3 symptoms are the additional questions quarried

References

1. Kelvin FM, Maglinte DD, Hale DS and Benson JT: Female pelvic organ prolapse: a comparison of triphasic dynamic MR imaging and triphasic fluoroscopic cystocolpoproctography. AJR Am J Roentgenol. 174: 81-8, 2000

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