

THE URETHRAL-CORPORAL ANGLE: A NOVEL METHOD TO EVALUATE URETHRAL AXIS ROTATION, IMPROVING THE ASSESSMENT OF PATIENTS WITH STRESS URINARY INCONTINENCE.

Hypothesis / aims of study

The excessive urethral axis rotation is an established factor associated to stress urinary incontinence in dependence of lost of pelvic muscles support. Its measurement (classically performed with the Q-Tip test) remains as a tool during the assessment of women with stress urinary incontinence (SUI)(1-2).

The urethral-corporal angle (UCA) is formed by the intersection between the cephalic-caudal body axis and the urethral longitudinal axis, therefore, its measurement provides accurate information about the urethral mobility. The aim of our study was to measure the resting and stress urethral-corporal angle in females with and without SUI and to evaluate it as an objective tool to assess the urethral axis rotation in patients with SUI.

Study design, materials and methods

We present an observational study, comparing the UCA (in resting and stress) among women with and without SUI admitted to our service for any urological procedure requiring urethral instrumentation. The sample size calculation was assessed with OpenEpi version 3, obtaining a confidence interval of 95% and a power of 80%, with a sample of 32 patients, 16 for each group. We analyzed The UCA measurement was performed before the instrumentation, with the patient lying in lithotomy position in the table at 0 degrees, the urethral meatus was cleaned with povidone iodine and a cotton swab was introduced into the urethra to the bladder neck, the angle measurement was performed using the Angle Meter app in resting and stress after the Valsalva maneuver. Analyzed data included age, body mass index, pregnancy history, deliveries, cesarean sections and hysterectomy. We performed a bivariate analysis comparing the UCA among patients with and without stress urinary incontinence, Student's t-test was applied. For the bivariate analysis the statistical significance was considered with a $p < 0.05$. SPSS version 22 was used in this study.

Results

A total of 32 patients were included in the study, two groups formed of 16 patients were obtained according to the absence (group I) or presence (group II) of SUI. The mean age of our population was 46.8 (± 11.8), for group I the mean age was 38.8 years (± 9.6) and for group II was 54.9 (± 7.7), $p = 0.000$, the univariate analysis of the population is displayed on table 1. After measuring the resting and stress UCA we obtained a measured urethral rotation of 13.9° for group I and 24.1° for group II obtaining a $p = 0.007$. The urethral rotation difference found among groups was 17°, on the other hand for the UCA the difference found was of 27.3° ($p = 0.000$). According to the population characteristics, the greatest difference for UCA was found when comparing nulligravida and multigravida women.

Table 1. Univariate analysis

	without (n=16)	SUI with (n=16)	SUI	p
Age (years)	38.8 (± 9.6)	54.9 (± 7.7)		0.0001
UCAR	19.3 (± 14.3)	36.3 (± 11.7)		0.0001
UCAS	33.2 (± 14.5)	60.5 (± 12.3)		0.0001
Urethral rotation	13.9 (± 4.76)	24.1 (± 12.58)		0.007
BMI (kg/m ²)	26 (± 3.7)	29.5 (± 3.1)		0.008
Hysterectomy	2 (25)	6 (75)		0.1
Pregnancy (n/%)				0.03
Nulligravid	4 (66.7)	2 (33.3)		
1-2	10 (66.7)	5 (33.3)		
pregnancies				
>2	2 (18.2)	9 (81.8)		
pregnancies				
Births (n/%)				0.049
0 births	9 (64.3)	5 (35.7)		
1-2 births	6 (60)	4 (40)		
>2 births	1 (12.5)	7 (87.5)		
Caesareran section (n/%)				0.5
0 cs	10 (50)	10 (50)		
1-2 cs	6 (54.6)	5 (45.4)		
>2 cs	0 (0)	1 (100)		

POP-Q stage (n/%)			0.01
Stage 0	14 (70)	6 (30)	
Stage 1	1 (14.3)	6 (85.7)	
Stage 2	1 (25)	3 (75)	
Stage 3	0 (0)	1 (100)	

UCAR: urethro-corporal angle at rest, UCAS: urethro-corporal angle with stress, BMI: body mass index, cs: caesarean section, SUI: stress urinary incontinence

Interpretation of results

We found statistically significant differences among our two studied groups regarding the measurement of the resting and stress UCA. The findings obtained set the background for further studies related to surgical treatment of SUI where the UCA measurement previous and after the procedure could improve the outcomes and reduce the overcorrection after SUI operations.

Concluding message

Our study describes a novel alternative for the assessment of women with SUI. The UCA digital measurement overcomes the limitations of Q-Tip test such as bad posture placement and limitation of the urethral mobility due to the supine decubitus position, providing the urologist with an objective measure of the urethral axis rotation

References

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Disclosures

Funding: NONE **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Comite Local y de Investigación en Salud 3601 Instituto Mexicano del Seguro Social **Helsinki:** Yes **Informed Consent:** Yes