

## ABDOMINAL STRENGTH IN VOIDING PHASE : A RISK FACTOR OF RECURRENT URINARY TRACT INFECTIONS IN WOMEN

### Hypothesis / aims of study

Recurrent urinary tract infections (RUTI) are a common condition in women . The influence of lower urinary tract dysfunction (LUTD) on recurrent urinary tract infections in women is not clear.

Some authors have found an association in women between recurrent urinary tract infections and urinary disorders. However, these studies are transversal studies without control group.

The aim of our study is to test whether functional abnormalities of lower urinary tract constitute a risk factor for recurrence of urinary tract infection in women, comparing the prevalence of functional disorders of the lower urinary tract in a group of women with RUTI and a control group of women without this pathology.

### Study design, materials and methods

This case-control study integrates a sample of 49 women with recurrent urinary tract infections (cases) and 49 women without recurrent urinary tract infections (controls), referred to the urodynamics unit. RUTI was considered if occur at least three per year, characterized by the presence of symptoms of lower urinary tract function (LUTS) (frequency and pain to void ) associated with positive urine culture ( > 10<sup>5</sup> colonies / ml), separated by a symptom-free period of at least one week. It was considered in this definition a reinfection for different germ, and relapses if the same strain.

To calculate the required sample size, based on data published by Yang and Huang<sup>1</sup> was considered significant percentage of at least 50 % of patients with abdominal straining in RUTI group, versus 20% in the control group. It was considered 44 patients in each group to obtain a significance level of 5% and a bilateral 80% statistical power.

The patients underwent a medical questionnaire and an urodynamic study which included flowmetry, cystometry and pressure flow study with a polygraph Uro 2000 (MMS , Enschede , The Netherlands), according to the specifications of the ICS and the protocols of the Good Urodynamics Practice . Patients were placed in a sitting position and proceeded to bladder filling through a 8-French two-way transurethral catheter, with saline solution at room temperature and a rate of 50 ml / s.

Abdominal pressure was recorded by a transrectal balloon catheter and abdominal and bladder pressures were measured with reference to the atmospheric pressure. The filling phase over when the patient reports a strong desire to void or registered a terminal involuntary detrusor contraction.

### Results

The age of the patients with UTI's was 54 ± 17, 1 years. The age of the control group was 60 ± 12, 4 years and differences were significant (p = 0.041). There were no significant differences in urinary symptoms reported by patients in both groups.

Distribution of urodynamic data for both groups is shown in Table 1. The only parameter that showed significant differences was maximum abdominal pressure in voiding phase. The multivariate analysis found that the maximum abdominal pressure was the only variable that independently influenced the urinary infection (Table 2).

Table 1.- Comparing the distribution of urodynamic data between groups

	UTI	no UTI	Significance
Post-voiding residual urine in free Uroflowmetry (ml)*	303 ±172,5	269 ±123,5	0,278
Post-voiding residual urine in free Uroflowmetry (ml)*	21 ± 46,94	13 ±29,5	0,328
Maximum flow rate in free Uroflowmetry (ml/s)*	20 ± 9,4	19 ±10,4	0,615
EMG activity during free Uroflowmetry†	81%	91%	0,215
Maximum Cystometric capacity (ml)*	247 ± 99,2	224 ± 67,7	0,175
Detrusor pressure at cystometric capacity (cm H2O)*	14 ± 13,3	11 ± 8,1	0,259
Involuntary detrusor contraction†	31%	35%	0,830
Maximum flow rate in pressure/flow study (ml/s)*	20 ± 21,0	18 ± 9,5	0,447
Detrusor pressure at maximum flow rate in pressure/flow study (cm H2O)*	26 ± 14,6	32 ± 23,6	0,193
Maximum abdominal pressure in pressure/flow study (cm H2O)*	37 ± 18,6	28 ± 24,5	0,040 ‡

\* Mean ± standard deviation..

†. Proportion of patients with the data..

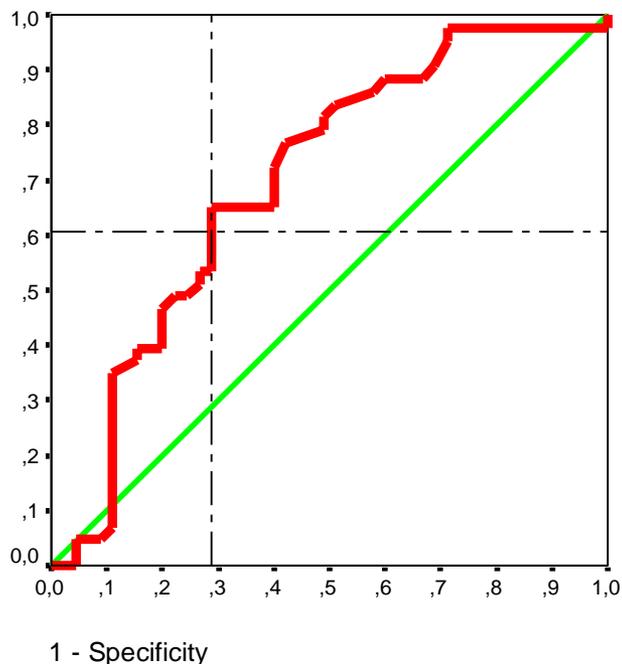
‡ Significant

Table 2.- Analysis of multivariate logistic regression.

Variable	Multivariate coefficient	Standard deviation	Significance
Age	0,006	0,015	0,712
Maximum Abdominal Pressure	0,022	0,011	0,045‡
Constant	-1,089	1,059	0,304

‡ Significant.

Figure 1 shows the result of the receiver operating curve of maximum abdominal pressure in voiding phase in patient with urinary infection. The ideal cut point (maximum sensitivity and specificity), was at 28 cm H<sub>2</sub>O



#### Interpretation of results

The main significant differences between these groups were age ( older in the control group) and the value of abdominal pressure during voiding ( higher in the group with UTIR) . After controlling the age, as a confounding factor, It was confirmed that the value of maximum abdominal pressure during voiding was the only factor to facilitate the RUTI. The cut-off point was at 28 cm H<sub>2</sub>O.

#### Concluding message

Abdominal strenght in the voiding phase constitutes a risk factor for recurrent urinary tract infections in women.

#### References

1. Yang JM(1), Huang WC Implications of abdominal straining in women with lower urinary tract Urology. 2002 Sep;60(3):428-33.

#### Disclosures

**Funding:** None **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** Is a retrospective case control study **Helsinki:** Yes **Informed Consent:** Yes