

## MAXIMUM URINARY FLOW DIFFERENCES BETWEEN FREE-FLOW AND PRESSURE-FLOW STUDY IN WOMEN: EFFECT OF BLADDER OUTLET OBSTRUCTION VERSUS DETRUSOR UNDERACTIVITY.

### Hypothesis / aims of study

Pressure recording urethral catheter during pressure-flow (P-F) study may increase the outflow resistance and subsequently reduce the maximum flow during invasive urodynamic study (UDS). Our main purpose was to examine the differences in maximum flow rate between free uroflow (f-Qmax) and P-F study (Qmax) in women. Consequently, we investigated whether a urodynamic diagnosis of bladder outlet obstruction (BOO) as opposed to detrusor underactivity (DU) could have a greater impact on the Qmax differences.

### Study design, materials and methods

We retrospectively studied data from women who had been submitted to invasive UDS due to LUTS and/or incontinence which were refractory to conservative treatment and/or pharmacotherapy. Based on previous work aiming to optimize the diagnosis of BOO versus DU in women (1,2) we categorized women based on the bladder outlet obstruction index (BOOI) and the urethral resistance association (URA) into three groups: those with definitive obstruction (Group A: URA>20+BOOI>20), those with equivocal obstruction (Group B: BOOI=1-19 + URA=0-19) and those without obstruction (Group C: BOOI≤0). Group C women were further divided into those with 'pure DU' (defined as less than 80% bladder voiding efficiency during free uroflow (f-BVE<80%)) and those considered as non obstructive non underactive (non BOO-non DU). Unpaired t test and one way ANOVA were used for statistical analysis.

### Results (Table 1)

A total of 253 women were included in the analysis. Based on the group categorization criteria, 19.36% (n=49/253) of women were definitively obstructive, while definitively another 53% (134/253) of women were non obstructive. The mean maximum urinary flow reduction during P-F study was 25.5%. The highest reduction was observed among obstructed women. The increase of outflow resistance as expressed with BOOI and URA was correlated with a statistically significant reduction of maximum urinary flow reduction during P-F study (One way Anova, p=0.001). During direct comparison between those with pure DU and those with non BOO-non DU, interestingly there was no difference between f-Qmax and Qmax among underactive women while the mean reduction among NO BOO-NO DU was 24%.

Group	Mean f-Qmax	Mean Qmax	P value	Mean reduction(%)
A (n=49)	9.87	5.88	0.0036	40.4
B (n=70)	15.30	9.99	<0.0001	34.7
C (n=134)	25.72	20.39	0.0002	20.7
<b>Total (n=253)</b>	<b>19.75</b>	<b>14.70</b>	<b>&lt;0.0001</b>	<b>25.5</b>

**Table 1.** Mean differences between f-Qmax and Qmax between the 3 main groups of women.

Group	Mean f-Qmax	Mean Qmax	Pvalue	Mean reduction (%)
Pure DU (n=27)	16.44	16.00	0.866	2.68
Non BOO/non DU (n=107)	28.12	21.34	<0.0001	24.09

**Table 2.** Mean differences between f-Qmax and Qmax in pure underactive compared to non obstructed - non underactive women.

### Interpretation of results

The pressure recording urethral catheter used for the pressure-flow study reduced the maximum flow during invasive urodynamic study by approximately 25%. The degree of outflow resistance may produce a further reduction in maximum flow during P-F while detrusor underactivity seems to have no impact on f-Qmax during an invasive urodynamic study.

### Concluding message

A reduction of at least 20% between Qmax during UDS and f-Qmax during uroflow in women is almost always expected. A reduction of Qmax during P-F study may be indicative of outflow obstruction as opposed to detrusor underactivity, while the higher reduction the higher could be the degree of BOO.

### References

1. Mytilekas KV, Ioannidou E., Kalaitzi M., Ioannidis E. Apostolidis A. evaluation of two novel urodynamic parameters in the diagnosis of female obstructive voiding. Hellenic Urology Volume 28 | issue 1 : 54-60
2. K.V. Mytilekas , A. Oeconomou , I. Sokolakis , E. Ioannidou , M. Kalaitzi , A. Apostolidis Defining voiding problems in women: Bladder outlet obstruction versus detrusor underactivity. European Urology Supplements , 2014 , 13 , 1 , e688
3. Mytilekas K.V., Ioannidou E., Kalaitzi M., Georgopoulos P., Ioannidis E., Apostolidis A Defining urodynamic bladder outlet obstruction (BOO) and detrusor underactivity (DU), with a novel common for both genders nomogram Poster Session: The lazy and the lively bladder e988 European Association of Urology (EAU) Annual Congress 2016, 11-15/03/2016 Munich, Germany.

Disclosures

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