

## URODYNAMIC TRENDS IN THE FEMALE AGING POPULATION: DETRUSOR OVERACTIVITY WITH IMPAIRED CONTRACTILITY, TWO CONDITIONS OR ONE?

### Hypothesis / aims of study

Lower urinary tract (LUT) dysfunction is a major cause of morbidity and decreased quality of life in the elderly. Studies have shown that symptoms of LUT disease increase with age, vary by gender, and may be related to detrusor overactivity with impaired contractility, previously referred to as DHIC.[1]

### Study design, materials and methods

913 women underwent outpatient multichannel video urodynamics (UDS) between November 2006 and September 2008. 176 women were 75 years of age and older. UDS parameters in older females were compared to the 737 female patients in this sample who were under age 75. Stratification of the data to exclude diagnoses likely to affect voiding parameters allowed for comparison of variables that may be influenced by age alone. Student's t-test was used to determine statistical significance.

### Results

The older population voided with lower non-invasive flow rates (nonQmax), lower invasive flow rates (Qmax), lower voiding pressures at peak flow (PdetQmax), higher post void residuals (PVR), and experienced more detrusor overactivity (DO) than the younger population (Table 1). Stratification of data to exclude likely confounding causes of obstruction (pelvic organ prolapse, urethral stricture, prior bladder augmentation, and neurogenic bladder dysfunction) continued to show statistically significant differences in these parameters. Furthermore, exclusion of patients with stress urinary incontinence which may decrease PdetQmax by decreasing outlet resistance did not nullify the effect. Within the older group (Table 2), patients with DO had lower PVR and Qmax and no difference in PdetQmax compared to those without DO (which is the opposite of what is suggested in DHIC). Patients with PVR>100 had less DO than those with PVR<100. Within the older group we also compared PdetQmax >20 cmH<sub>2</sub>O and <20 cmH<sub>2</sub>O and showed no difference in DO with a trend toward lower PVR in the PdetQmax <20cmH<sub>2</sub>O group, opposite of what is suggested in DHIC.

### Interpretation of results

Aging appears to have significant impact on LUT function. Matched stratification of the older and younger groups suggests age is a significant predictor of decreased Qmax, decreased non-invasive flow, decreased PdetQmax, increased PVR, and increased DO. In addition, our results challenge the concept of DHIC in the aging population. We present evidence that the two conditions (DH and IC) occur at greater rate in those over age 75, but that these conditions are not necessarily linked.

### Concluding message

Age alone appears to be a significant predictor of Qmax, PdetQmax, PVR and DO. DHIC may not be a true phenomenon in the outpatient, elderly population.

**Table 1. Urodynamic parameters in women  $\geq 75$  and <75 with exclusion of confounding diagnoses, n= 913**

GB, SUI

\*Excluding POP, US, BA, NGB

\*\*Excluding POP, US, BA,

	Age $\geq 75$ n =176	Age<75 n =737	p value	Age $\geq 75$ n =114	Age<75 n =494	p value	Age $\geq 75$ n =73	Age<75 n =350	p value
nonQmax (ml/s)	14.0	19.7	< 0.01	13.8	20.7	< 0.01	12.3	19.6	0.02
mean PVR (ml)	114.6	87.7	< 0.01	102.2	77.7	0.04	128.3	83.0	0.02
Qmax (ml/s)	13.3	16.7	< 0.01	14.1	17.7	0.02	11.9	16.3	< 0.01
PdetQmax (cmH <sub>2</sub> O)	33.4	38.2	0.03	34.1	38.4	0.05	34.3	42.7	0.03
with DO	43.1%	26.5%	< 0.01	44.7%	26.7%	< 0.01	43.8%	28.5%	< 0.01
DLPP (cmH <sub>2</sub> O)	32.1	38.5	< 0.01	31.9	38.9	0.06	33.7	36.5	0.54

Excluding pelvic organ prolapse (POP)  $\geq$ Stage 2, urethral stricture (US), bladder augmentation (BA), neurogenic bladder (NGB)  
Also excluding stress incontinence (SUI)

Qmax, maximum flow rate; PVR, post void residual; PdetQmax, detrusor pressure at maximum flow; DO, detrusor overactivity;  
DLPP, Detrusor Leak Point Pressure

**Table 2. Urodynamic parameters in women  $\geq 75$  with exclusion of confounding diagnoses stratified by DO, PVR and PdetQmax, n=73**

	+ DO	No DO	p value	PVR $\geq$ 100	PVR<100	p value	PdetQmax <20 cmH <sub>2</sub> O	PdetQmax $\geq$ 20 cmH <sub>2</sub> O	p value
Qmax (ml/s)	12.2	12.4	0.95	12.1	12.6	0.83	15.0	12.1	0.49
mean PVR (ml)	<b>88.2</b>	<b>166.5</b>	<b>0.03</b>	254.6	32.2	n/a	<b>29.2</b>	<b>140</b>	<b>0.08</b>
Qmax (ml/s)	<b>9.7</b>	<b>13.1</b>	<b>0.04</b>	9.6	12.8	0.06	14.4	11.2	0.35
PdetQmax (cmH <sub>2</sub> O)	35.2	32.7	0.55	38.4	32.3	0.15	14.2	37.2	n/a
<b>with DO</b>	100%	0	n/a	<b>29%</b>	<b>56.0%</b>	<b>0.02</b>	<b>50%</b>	<b>63%</b>	<b>0.54</b>

Qmax, maximum flow rate; PVR, post void residual; PdetQmax, detrusor pressure at maximum flow DO, detrusor overactivity; LPP, Detrusor Leak Point Pressure.

### References

1. Resnick NM, Yalla SV. Detrusor hyperactivity with impaired contractile function

<i>Specify source of funding or grant</i>	None
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	University of California, Los Angeles Office for Protection of Research Subjects Institutional Review Board (IRB)
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	No