

## IS THERE AGREEMENT BETWEEN PHYSICIANS' DIAGNOSES AND OPERATOR-INDEPENDENT ASSESSMENT TOOLS IN WOMEN WITH VOIDING SYMPTOMS?

### Hypothesis / aims of study

The objective assessment of female voiding dysfunction remains a challenge. Voiding difficulty can be also diagnosed in asymptomatic women. In addition, in women with non-neurogenic voiding symptoms there is a wide range of reported incidence of bladder outlet obstruction (BOO)(3-23%), while no clear record of the incidence of detrusor underactivity (DUA) exists. The Blaivas-Groutz nomogram is accepted as an operator-independent tool for assessment of BOO in women, despite criticism debating its specificity /sensitivity. Further, no nomogram has been proposed for assessment of DUA in women, as opposed to the Detrusor Contractility Index (DCI) which is used in men.

In a cohort of women who reported voiding symptoms and underwent urodynamic investigation we examined the level of agreement between physicians' diagnoses and operator-independent nomograms/indices.

### Study design, materials and methods

In this retrospective exploratory study, we reviewed the pressure-flow traces and non-invasive uroflowmetries of non-neurological female patients who visited a Female Urology outpatient clinic claiming voiding symptoms. The ICS definitions were applied for physicians' diagnoses, who categorised women as 'normal', 'BOO' and 'DUA' accordingly. These diagnoses were then examined for level of agreement with the diagnoses based on the Blaivas-Groutz nomogram, the urethral resistance factor (URA), as well as the Abrams-Griffiths (AG) number and the DCI. The latter are used to define presence of BOO or DUA, respectively, in men.

The Kappa coefficient was used to test for level of agreement between physicians' diagnoses and diagnoses based on the nomograms/indices. Descriptive statistics were also used, where values were expressed as mean  $\pm$  SD.

### Results

*Sample characteristics:* Pressure-flow investigations and uroflowmetries from 58 women (mean age 56.8 years, range 18-82 years) were reviewed. Upon presentation, 6 (10.3%) women had a history of at least one retention episode. Thirty-one (53.4%) women had also complained of storage LUTS/OAB symptoms, 18 (31.0%) of recurrent urinary tract infections, 9 (15.5%) of pelvic organ prolapse, and 9 (15.5%) of bladder pain. Twenty women (34.4%) also reported some form of incontinence and 2 (3.4%) had had previous surgery for incontinence.

*Diagnoses:* One was excluded due to lack of both non-invasive and pressure-flow uroflowmetry. In the remaining 57 traces, 3 (5.3%), 18 (31.6%) and 36 (63.2%) were diagnosed as 'normal', 'BOO' and 'DUA', respectively, by the physician. Using the Blaivas-Groutz nomogram, however, 44 women (77.2%) were diagnosed with various degrees of obstruction (n=30 mild obstruction, n=8 moderate and n=6 severe obstruction). When the AG number and the DCI were applied, 9 (15.8%) women would have had BOO and 43 (75.4%) DUA, respectively. Finally, the URA could be calculated in 47 women. Using a cut-off value of 20, the URA factor identified obstruction in 19/47 (40.4%) women, the remaining 28/47 (59.6%) women diagnosed as unobstructed.

*Agreements:* A fair level of agreement after chance was excluded (kappa coefficient =0.240, p <0.01) was found in cases of obstruction between physician's diagnosis and the Blaivas-Groutz nomogram. A moderate level of agreement (kappa coefficient =0.484, p<0.01) would have been found if the AG number had been applied. However, an excellent level of agreement was found in cases of obstruction when applying the URA factor (kappa coefficient = 0.864, p <0.01).

In cases of DUA diagnosis, a fair level of agreement (kappa coefficient = 0.311, p <0.05) was found between physician's diagnosis and the DCI.

Using descriptive statistics, the Blaivas-Groutz nomogram and physicians' diagnosis agreed in all cases with 'no BOO' and 'moderate BOO,' and in 5/6 cases with 'severe' BOO. In the 'mild' BOO category, however, agreement with physician's diagnosis could be seen in only 5/30 cases, with the remaining 25/30 being diagnosed by the physician as having DUA. Similarly, the URA diagnosis agreed with the Blaivas-Groutz nomogram in all cases with 'no BOO', 'moderate BOO,' and 'severe' BOO. In the 'mild' BOO category, however, agreement with physician's diagnosis could be seen in only 8/27 cases, with the remaining 19/27 being diagnosed as having 'no BOO' under URA.

Women with a clinical DUA diagnosis were older than those with BOO diagnosis (61.9 vs 49.0 years of age, p=0.005), had a higher Qmax in non-invasive uroflowmetry (13.3 $\pm$ 1.3 ml/s vs 8.7 $\pm$ 1.6 ml/s, p=0.02) and a lower PdetQmax (18.3 $\pm$ 2.1 vs 57.3 $\pm$ 6.7, p<0.0001).

### Interpretation of results

Women with voiding symptoms represent a heterogeneous patient population.

Nomograms and indices do not take into account parameters such as the duration of detrusor contraction and bladder emptying efficiency which are used in ICS definitions, especially of DUA. Also, the use of abdominal straining during voiding and the

overall shape of the trace cannot be evaluated by nomograms, but are commonly assessed by physicians to establish an urodynamic diagnosis.

Further to the sample size, lack of a control group of asymptomatic women are limitations of this exploratory study.

#### Concluding message

In this small-medium sized, heterogeneous outpatient population of women presenting with voiding symptoms, detrusor underactivity was a common clinical diagnosis particularly in older women. Most proposed nomograms and indices for BOO or DUA showed fair to moderate agreement with physicians' diagnoses, with the exception of the URA factor which showed excellent level of agreement. Disagreement was most common in the mild obstruction zone of the Blaivas-Groutz nomogram. Although it could be argued that a physician's diagnosis should be based on a combination of clinical/urodynamic findings and operator-independent nomograms, it is possible that further research and consensus is needed to establish criteria for diagnosis of BOO and DUA in women.

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<b><i>Is this a clinical trial?</i></b>	<b>No</b>
<b><i>What were the subjects in the study?</i></b>	<b>HUMAN</b>
<b><i>Was this study approved by an ethics committee?</i></b>	<b>No</b>
<b><i>This study did not require ethics committee approval because</i></b>	<b>Retrospective analysis of urodynamic traces - urodynamics were performed for diagnostic purposes - no additional intervention was performed on the subjects and no personal data were entered</b>
<b><i>Was the Declaration of Helsinki followed?</i></b>	<b>Yes</b>
<b><i>Was informed consent obtained from the patients?</i></b>	<b>No</b>