

MAXIMUM BLADDER VOLUME AS SURROGATE SCREENING TEST FOR DETRUSOR OVERACTIVITY

Hypothesis / aims of study

Urodynamic investigation is required to achieve an objective diagnosis in incontinence, most useful in identifying idiopathic detrusor overactivity (DO) in women with mixed symptoms or those where conservative treatment has failed. However, the National Institute for Clinical Excellence in the UK, and other organisations have cast doubt on the utility of routine urodynamic assessment of all patients. DO manifests with frequency of micturition and small volume voids, often accompanied by detrusor contractions on urodynamic assessment. Anecdotally, patients with DO appear to pass small volumes regularly and so, measured maximum bladder volume could be a simple surrogate measure to screen for DO. This study aimed to examine the utility of the single largest recorded voided volume from a 3 day urinary diary as a screening test for DO.

Study design, materials and methods

Case notes from women attending urodynamics at a large tertiary centre between September 2008 and September 2009 were obtained and the urodynamic traces reviewed. Urodynamic traces were categorised as normal, DO, mixed (DO & urodynamic stress incontinence [USI]), and USI alone. Urodynamic data including maximum free flow voided volume, volume at strong desire, maximum cystometric capacity, volume voided after cystometry, and maximum voided volume were compared between the categories using Kruskal Wallis test. Data are presented as median [range]. Receiver operator characteristic (ROC) curves were constructed using DO as the state variable (SPSS v 16) to assess the test performance and cutoff volume for cystometric data and maximum bladder volume as a screening test.

Results

577 women attending urodynamics during the study window. Urodynamic data were available for all women, but the casenotes were only retrievable for 385 women. The mean age of the women was 54.1 years (SD 13.2). 300 traces (52%) showed USI, 92 (15.9%) mixed incontinence, 78 (13.5%) DOA, and 107 (18.5%) were normal. All urodynamic values showed an increase in volume from traces with DO, through mixed incontinence to largest volumes in the traces labelled as normal or USI (Table1). Maximum recorded diary volume did not show the same trend.

	Free flow voided volume	Volume at strong desire	Volume at capacity	Volume voided after cystometry	Maximum recorded diary volume
Normal	279 [6-1118]	329 [130-639]	438 [193-711]	473 [10-851]	400 [100-950]
USI	262.5 [4-1184]	357 [0-742]	451 [207-755]	471 [0-990]	370 [60-770]
Mixed	195 [20-993]	266 [74-596]	403.5 [201-675]	420 [0-710]	400 [200-1000]
DOA	191.5 [9-820]	244 [36-571]	335.5 [65-576]	324 [0-600]	450 [100-1193]
p	0.003	<0.001	<0.001	<0.001	0.146

ROC curves for urodynamic variables demonstrated extremely poor sensitivity and specificity, approximating to straight lines (Figure 1). The ROC for maximum recorded diary volume also showed very poor discrimination for DO (Figure 2).

Interpretation of results

This large cohort of urodynamic studies demonstrates that individual measures of bladder capacity recorded during urodynamic testing which may reflect functional bladder capacity do not have sufficient discrimination to replace urodynamic testing. The single maximum volume recorded in a three day bladder diary actually showed worse discrimination, with no change in median value by diagnostic group and very poor performance as a screening test.

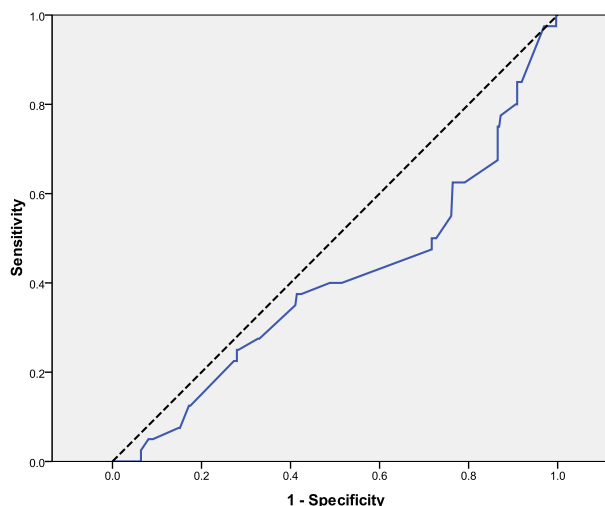
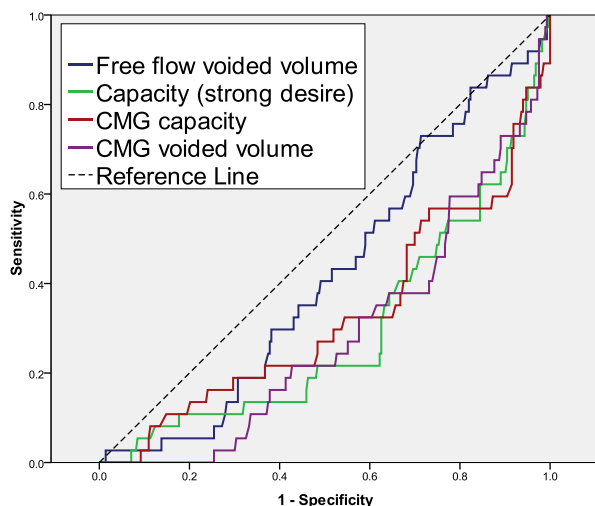


Figure 1-ROC curves for urodynamic variables

Figure 2- ROC curve for maximum recorded diary volume

Concluding message

Single diary maximum voided volumes and other urodynamic data providing estimates of bladder function do not show discrimination for individual diagnoses. When the clinical need for an objective diagnosis has been established, formal urodynamics are still required.

<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>	No
<i>This study did not require ethics committee approval because</i>	It was a retrospective review of casenotes and routinely collected clinical data.
<i>Was the Declaration of Helsinki followed?</i>	No
<i>This study did not follow the Declaration of Helsinki in the sense that</i>	Not applicable to this retrospective study of routinely collected data.
<i>Was informed consent obtained from the patients?</i>	No