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# UROFLOWMETRY IN WOMEN WITH PELVIC ORGAN PROLAPSE AND URINARY INCONTINENCE IN PRIMARY CARE, A CROSS SECTIONAL STUDY

Hypothesis / aims of study

Pelvic organ prolapse (POP) is a common condition in elderly women. Women with POP may have a variety of lower urinary tract symptoms (LUTS), of which urinary incontinence is the most common. Besides LUTS voiding dysfunction may exist in women with POP, which can be determined by uroflowmetry. Uroflowmetry can be used to evaluate the micturition process in women with POP and LUTS. However, interpretation of flowcurves is subjective with inter-observer variability in the interpretation of the flow curves, therefore several objective assessment methods have been described in literature (1,2). In the Netherlands, the majority of women with POP are treated in primary care. Uroflowmetry may be useful in the diagnostic approach and decision making process concerning referral of a patient with POP and LUTS from primary to secondary care.
The aim of this study was to investigate the prevalence of voiding dysfunction, assessed by two different methods, in older women with POP and urinary incontinence in primary care. Secondary, we investigated which factors best predicted voiding dysfunction in these women.

Study design, materials and methods

This is a cross-sectional study in women (≥55 years), registered in 21 general practices in the northern part of the Netherlands, who screened positive on urinary incontinence. Data were used from the POPPS project (2009-2012) and the URINO project (2008-2011). The POPPS project incorporates two randomized controlled trials on the effects and cost-effectiveness of conservative treatments for pelvic organ prolapse in older women. The URINO project investigated the effects and cost effectiveness of an evidence-based treatment compared to usual care (according to the Dutch Guidelines for General Practitioners) in elderly women with urinary incontinence.
The main outcome in this study constituted voiding dysfunction, measured with free uroflowmetry. The flowcurves were interpreted either using the Liverpool Nomograms (method A)(1) or using maximum urine flow rate, post voided volume and voided volume (method B)(2). A flowcurve was considered interpretable in case of voided volume between 15-600 ml (method A) or in case of a minimum voided volume of 150ml (method B). Voiding dysfunction was defined as a flow <10th centile curve of the Liverpool Nomograms (method A) or as a flow with a maximum urine flow rate of <15 ml/sec and/or post voided residue >50 mL (method B). LUTS were measured with the Urinary Distress Inventory-6 (UDI-6) and POP was assessed using the Pelvic Organ Prolapse Quantification (POP-Q).
Sample size calculation, based on the percentage of voiding dysfunction in women with POP, indicated that 225 women had to be included in this study with a power of 0.8, alpha of 0.05 and Yates correction.
The analyses included all women who reported urinary incontinence on the screening questionnaire, had a POP and performed uroflowmetry. Fisher's exact test was used to compare interpretability and voiding dysfunction assessed by method A and method B. A value of $P<0.05$ was considered significant and all statistical tests were 2-tailed. We performed bivariate and multivariate logistic analyses to investigate which variables best predicted voiding dysfunction. Voiding dysfunction (dichotomous) was the outcome variables. Determinants were patient characteristics, POP-Q stage and LUTS. Determinants with $p<0.157$ in bivariate analyses were selected for multivariate analyses. In the multivariate analysis, a best subset backward stepwise elimination procedure was manually performed, with $p>0.157$ as criterion for removal from the model (3).

Results

233 women with POP and urinary incontinence with a median age of 63.2 year were included.
95 women had POP-Q stage I, 118 women stage II and 20 women stage III. 39.7% of all women had obstructive urinary symptoms. Table 1 shows the uroflowmetry results, assessed with method A and method B. Table 2 shows the results of bivariate and multivariate analyses.

**Table 1. Uroflowmetry results assessed with method A and method B, N=222**

| | Method A* | Method B† | *p*-value‡ |
|---|---|---|---|
| No interpretable uroflowmetry, N(%) | 10 (4.5) | 73 (32.9) | < 0.001 |
| Interpretable uroflowmetry, N(%) | 212 (95.5) | 149 (67.1) | < 0.001 |
| No voiding dysfunction, N(%) | 135 (66.8) | 112 (75.2) | < 0.001 |
| Voiding dysfunction, N(%) | 77 (33.2) | 37 (24.8) | < 0.001 |

**Method A: Liverpool Nomograms, †Method B: assessment based on maximum urine flow rate, post voided volume and voided volume, ‡ Fisher's exact test.*

**Table 2. Multiple logistic regression analyses to predict voiding dysfunction, N=233.**

| Determinants | **Method A*** Univariate OR (CI) | Multivariate OR (CI)‡ | **Method B†** Univariate OR (CI) | Multivariate OR (CI)‡ |
|---|---|---|---|---|
| Age | 1.04 (1.00-1.06)§ | 1.04 (1.00-1.07) | 1.08 (1.04-1.12)§ | 1.08 (1.04-1.12) |
| BMI | 1.01 (0.99-1.03) | | 1.02 (1.00-1.04)§ | |
| Parity | 1.03 (0.89-1.20) | | 0.99 (0.82-1.21) | |
| Gyn. surgery | 0.92 (0.64-1.33) | | 1.55 (1.08-2.24) | |
| Incontinence | 1.04 (0.42-2.56) | | 1.26 (0.48-3.28) | |

| | | | | |
|---|---|---|---|---|
| Stress | 0.65 (0.43-0.98)[§] | | 0.49 (0.29-0.85)[§] | |
| Urgency | 0.94 (0.61-1.46) | | 1.01 (0.62-1.95) | |
| Mixed | 0.98 (0.65-1.48) | | 1.57 (0.92-2.69) | |
| Obstructive symptoms | 1.14 (0.76-1.73) | | 1.80 (0.98-3.10) | |
| Pain in lower abdomen | 1.03 (0.69-1.56) | | 1.08 (0.62-1.86) | |
| POP-Q stage | 1.32 (0.96-1.83) | | 2.00 (1.32-3.02)[§] | |
| Compartment involvement | | | | |
| Anterior wall | 1.23 (0.93-1.62) | | 1.63 (1.13-2.33)[§] | 1.79 (1.21-2.61) |
| Uterine | 1.30 (0.89-1.89) | | 0.97 (0.60-1.58) | |
| Posterior wall | 1.37 (1.06-1.77)[§] | 1.38 (1.07-1.79) | 1.63 (1.15-2.30)[§] | 1.88 (1.28-2.74) |

*Abbreviations: CI=confidence interval; OR=odds ratio; POP=pelvic organ prolapse;*
*[*] Method A: Liverpool Nomograms; [†]Method B: assessment based on maximum urine flow rate, post voided volume and voided volume; [‡] Final multivariate model, items selected p<0.157; [§] Items selected with p<0.157.*

Interpretation of results

Method A resulted in a higher percentage of interpretable flowcurves compared to method B. Method A led to significantly more voiding dysfunction cases compared with method B.
Predictive factors for the presence of voiding dysfunction were increasing age and involvement of the posterior vaginal wall by using method A. Increasing age and involvement of both anterior and posterior vaginal wall were predictors for the presence of voiding dysfunction assessed by method B.

Concluding message

More flowcurves could be interpreted with method A, therefore we recommend the use of method A instead of method B. Increasing age and involvement of the posterior vaginal wall were predictive for the presence of voiding dysfunction but not LUTS symptoms or POP-Q stage. Free uroflowmetry provides extra information about the micturition process in women with POP and incontinence and is possibly valuable in the diagnostic approach and decision making process concerning referral of a patient with POP and incontinence from primary to secondary care.
Further research should determine whether uroflowmetry alters management of women with POP and incontinence in primary care.

References


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Disclosures


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