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CAN THE OUTCOME OF CONTINENCE SURGERY BE PREDICTED USING URODYNAMIC PARAMETERS?

Hypothesis / aims of study
Patients with urodynamic mixed incontinence are a challenge to treat. They are more likely to suffer persistent overactive bladder symptoms and detrusor overactivity post-operatively. There have been previous studies trying to determine whether urodynamic parameters will predict the outcome of continence surgery for mixed incontinence, but there is no test that allows us to predict which patients will have a good outcome. Preoperative prediction would enhance pre-operative counselling of these patients prior to continence surgery and allow physicians to contemplate the best treatment for their patients on an individual basis. This study aims to determine whether specific urodynamic parameters can predict the symptomatic and urodynamic outcome of continence surgery in patients with mixed urinary incontinence.
Study design, materials and methods
This study reviewed women at a single centre, all demonstrated pre-operative urodynamic stress urinary incontinence and detrusor overactivity (DO). These women underwent clinical assessment with full history and examination, completion of the Kings Health Questionnaire and micturition diary and conventional urodynamic studies. Patients were treated with combined therapy of pelvic floor exercises, and anti-cholinergic medication. Those with persistence of their stress incontinence symptoms underwent TVT procedure under spinal anaesthesia. Patients were followed up with a 6 month post-operative assessment which included clinical evaluation with urinary symptom assessment, Kings Health Questionnaire and urodynamics. The following pre- and post-operative urodynamic parameters were assessed: opening detrusor pressure, detrusor pressure at maximum flow, closing detrusor pressure. These were correlated with post-operative urodynamic detrusor overactivity and were also symptoms of overactive bladder.
Results
51 women were reviewed with a median age of 52 yrs (34-82). They were followed up between 6 and 26 months (median follow-up time in months was 12 (6-26)). Of 51 women included, 46 were followed up for more than 6 months. 35/46 agreed to have post-operative urodynamics. 35 women had urodynamics post-operatively and 19 (54.3%) had post-operative detrusor overactivity, and eleven women (58%) reported post-op overactive bladder symptoms, eight (42%) had no post-op overactive bladder symptoms. Overall 16 women had a stable bladder on urodynamics post-operatively but six women (37.5%) reported symptoms of overactive bladder.

Table 1: Pre-operative detrusor pressures in patients with/without DO following TVT.

	Mean opening detrusor pressure (cmH2O)	Mean detrusor pressure at maximum flow (cmH2O)	Mean closing detrusor pressure (cmH2O)
Patients with DO following TVT (n=19)	32.6 (sd: 14.9)	40.9 (sd: 16.0)	41.1 (sd 38.8)
Patients with stable bladder following TVT (n=16)	19.1 (sd: 7.8)	35.4 (sd: 14.7)	22.9 (sd: 7.79)

Table 2: Post-operative detrusor pressures in patients with/without DO following TVT

	Mean opening detrusor pressure (cmH2O)	Mean detrusor pressure at maximum flow (cmH2O)	Mean closing detrusor pressure (cmH2O)
Patients with DO following TVT (n=19)	26.8 (sd: 15.1)	39.2 (sd: 13.9)	33.2 (sd: 21.4)
Patients with stable bladder following TVT (n=16)	14.63 (sd: 6.9)	32.6 (sd: 8.69)	21.3 (sd:12.4)

Table 3: Pre-operative detrusor pressures in patients with/without OAB symptoms after TVT.

	Mean opening detrusor pressure (cmH2O)	Mean detrusor pressure at maximum flow (cmH2O)	Mean closing detrusor pressure (cmH2O)
Patients with overactive bladder symptoms following TVT (n=17)	28.9 (sd: 14.4)	41.5 (sd: 14.1)	41.8 (sd: 39.8)
Patients without overactive bladder	23.4 (sd: 13.3)	35.5 (sd:16.4)	23.3 (sd: 8.44)

symptoms following TVT (n=18)			

Table 4: Post-operative detrusor pressures in patients with/without OAB symptoms after TVT.

	Mean opening detrusor pressure (cmH2O)	Mean detrusor pressure at maximum flow (cmH2O)	Mean closing detrusor pressure (cmH2O)
Patients with overactive bladder symptoms following TVT (n=17)	27.9 (sd: 14.4)	41.3 (sd: 12.6)	36.8 (sd: 21.7)
Patients without overactive bladder symptoms following TVT (n=16)	15.0 (sd 8.85)	29.9 (sd: 8.18)	18.8 (sd 8.73)

There was a statistically significant difference between the pre-operative and post-operative opening detrusor pressures of those women that had detrusor overactivity post-operatively (19/35) and those who had a stable bladder post-operatively (16/35) $p<0.05$ Mann Whitney U.

There was no statistically significant difference in the pre-operative parameters in those patients that had post-operative overactive bladder symptoms and those that did not. Post-operatively, mean opening and closing detrusor pressures, and mean detrusor pressure at maximum flow all were statistically significantly different between those patients that had overactive bladder symptoms (17/35) and those that did not (18/35) $p<0.05$ Mann Whitney U.

Interpretation of results

The preoperative opening detrusor pressure is predictive of the persistence of detrusor overactivity postoperatively. There is no change in the opening pressure and PdetQmax as a result of surgery, thus the transvaginal tape is not changing the presence of detrusor overactivity by obstructing the urethral outlet. Women with overactive bladder symptoms post-operatively demonstrate significantly higher opening and closing detrusor pressures and detrusor pressures at maximum flow compared to those without overactive bladder symptoms post-operatively.

Concluding message

Opening detrusor pressure is predictive of outcome of surgery. Pre-operative urodynamic parameters that we assessed were not predictive of the persistence of overactive bladder symptoms post-operatively.

References: 1. Urology. 2003 Jan;61(1):37-49. Neurourol Urodyn. 2007;26(1):115-21. Acta Obstet Gynecol Scand. 2006;85(8):986-92

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HUMAN SUBJECTS: This study was approved by the St. Marys LREC and followed the Declaration of Helsinki Informed consent was obtained from the patients.