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VALIDATION OF THE TOTO FLOWSKY UROFLOWMETRY DEVICE

Hypothesis / aims of study

The European Association of Urology (EAU) guideline (1) recommends uroflowmetry as a diagnostic assessment in the workup of patients with lower urinary tract symptoms (LUTS) and is an obligatory test prior to surgical intervention. The current uroflowmetry is an artificial machine and uroflow test result can be variable. Factors such as patient's anxiety, environment, volume of voided urine and timing can affect the uroflow tracing.

The Toto 'Flowsky' device is a toilet bowel with dynamic sensors incorporated into it, thereby allowing patients to void in a familiar environment. Patient pressed the activating button to initiate the voiding process. The whole urinary flow would capture the start to the end of the voiding phase – Time prior to initiation of voiding (hesitancy), maximum flow rate (Qmax), voiding time, volume of voided urine and residual volume.

Our aim was to compare the TOTO Flowsky device with the conventional uroflow machine.

Study design, materials and methods

We recruited 55 males with LUTS. After encouragement of fluid intake, a pre-void bladder scan was done once they experienced 'a sensation to void'. If the bladder scan was between 200 – 400mls, they were randomised into the following groups and asked to do 2 separate voids in the following sequence:

- Group 1: - Conventional uroflow Machine → Toto 'FlowSky' Toilet
- Group 2: - TOTO 'FlowSky' Toilet → Conventional UF Machine

Patients completed the International Prostate Symptom Score (IPSS) Questionnaire and a Patient's Anxiety Questionnaire (Gad-7). Analysis was done using paired student t-test.

Results

55 subjects with LUTS (mean aged 64 years old) completed the study. Their results were summarized in Table 1 and Table 2

Table1: Results comparing TOTO Flow Device with Conventional Flow Device

	Conventional Flow	**TOTO Flow**	**p-Value**
Age	65 years		
IPSS	11.16 ± 7.22		
QOL	2.35 ± 1.59		
Anxiety Score	3.0 ± 5.67		
Qmax (ml/s)	15.98 ± 7.14	14.49 ± 6.27	0.1888
Voided Volume/ml	270.7 ± 115.7	273.6 ± 96.58	0.9380
Residual Volume/ml	44.36 ± 50.54	62.15 ± 68.03	0.1830
Voiding Time/sec	68.68 ± 40.85	53.65 ± 33.0	0.0472
Time to Qmax/sec	11.33 ± 18.66	16.69 ± 16.73	0.1224
Flow Time/sec	49.51 ± 34.14	40.40 ± 22.79	0.1349
Hesitancy Time/sec	-	23.34 ± 26.32	

Value expressed as a mean ± Standard Deviation

Qmax – Maximum flow rate
Voiding Time (VT) – The time from start to end of urination
Flow Time (FT) – Time during which there is urine flowing
Hesitancy Time (HT) – Time of initiation of urination process to the start of the urine stream

Interpretation of results

There were no significant differences in Qmax, VV, RU and VT between TOTO device and conventional uroflow device. No differences were found whether you did an uroflow using the conventional uroflow first or the Toto Flowsky toilet and vice versa.

Concluding message

In our study, we conclude uroflow tracing from Toto 'Flowsky' device was comparable and equalled to the conventional uroflowmetry machine. However, a much larger study is needed to further validate Toto 'Flowsky'.

By improving the quality of the uroflow tracing, clinician could quantify and assess the severity of the patient's LUTS. It would allow us to determine whether one would continue with medical therapy or opt for surgical intervention.

References

1. Guidelines on the Management of Non-Neurogenic Male Lower Urinary Tract Symptoms (LUTS), incl. Benign Prostatic Obstruction (BPO) – EAU Guidelines 2015

Disclosures

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