469

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MAY A CHECKLIST IMPROVE FREE UROFLOWMETRY QUALITY? RESULTS OF A MULTICENTER STUDY

Hypothesis / aims of study

Valuable and reliable information is obtained from uroflowmetry studies only if curve and data quality can be ensured. ICS reports on Good Urodynamic Practice (GUP) have been published to improve excellence in measurement, quality control and documentation of urodynamic investigations, including uroflowmetry [1]. Despite ICS recommendations, it is very common to find traces with artifacts, inadequate micturition volumes and incomplete information that makes difficult to obtain a good interpretation. Using a checklist may improve quality of different procedures. The aim of this study was to evaluate the ability to improve uroflowmetry quality implementing a checklist from GUP based on ICS recommendations.

Study design, materials and methods

Diagnostic, transversal, interventional study, designed to evaluate uroflowmetry quality performed in 5 urodynamic departments in Valencia (Spain), before and after implementing a checklist. We developed the Uroflowmetry Quality Score (UQS) tool in order to evaluate uroflowmetry trace and inform quality [2], including 14 items scoring from 0 to 1 (except item #2, exclusion of artifacts, scoring from 0 to 3). UQS ranges from 0 to 16 (Table 1). First group of uroflowmetries were done following usual daily practice, and the second group after implementing the checklist based on GUP recommendations of ICS. UQS and percentage of items correctly fulfilled were compared before and after checklist intervention, using T-Test for independent samples. Comparison among urodynamic centers were done using ANOVA (post-hoc comparison with Tukey test). P-value < 0.05 was considered significant.

Table 1: Uroflowmetry Quality Score

		Score
#1	Uroflowmetry indication included in application form	1
#2	Trace without artifacts	3
#3	Patient gender included in application form	1
#4	Scale adapted to patient's gender	1
#5	Volume voided is acceptable	1
#6	Post void residual volume has been calculated	1
#7	Time from micturition to postvoid volume measurement registered	1
#8	Trace labeled as a regular (habitual) micturition	1
#9	Trace has been reviewed and "smoothed"	1
#10	Qmax calculated with smoothed trace	1
#11	If trace has not been smoothed, Qmax labeled as Qmaxraw	1
#12	Qmax, voided and residual volume values have been rounded	1
#13	Results shown as ICS standard "Qmax/Volume voided/Post void residual volume"	1
#14	Presence of a validated nomogram	1

Results

First group included 98 uroflowmetries and second 229 traces. Each group UQS is shown in table 2. UQS increased significantly after checklist in both globally and in each department. Table 3 shows percentage of items fulfilled before and after checklist intervention.

Table 2: UQS for every Urodynamic Department (UD), before and after checklist intervention

UQS (n±SD)	UD1	UD2	UD3	UD4	UD5	Global
Before Checklist	5,79±1,13	8,61±1,23	5,65±0,98	7,88±0,69	6,13±0,95	6,89±1,59
After Checklist	11,03±1,77	13,96±1,57	7,30±0,67	11,50±1,05	10,63±0,97	10,44±2,41

All changes were statistically significant (p<0,0001)

Table 3: Percentage of items fulfilled before and after checklist intervention.

ITEM	Checklist intervention	UD1	UD2	UD3	UD4	UD5	Global
#1	Before	5,3	95,7	0	100	81,3	56,6
	After	86,9	79,2	11,7	86,7	95,8	67,2
#2	Before	94,7	87,5	95	100	93,8	93,9
	After	90,2	91,7	96,7	98,3	100	95,2
#3	Before	78,9	100	100	100	93,8	94,9
	After	83,6	100	100	100	100	95,6
#4	Before	10,5	100	0	40	31,3	39,4
	After	50,8	79,2	10	55	58,3	45
#5	Before	89,5	87,5	90	80	25	76,8
	After	50,8	91,7	88,3	85	75	76,4
#6	Before	100	100	0	90	100	77,8
	After	91,8	100	100	85	100	93,9
#7	Before	0	0	0	0	0	0
	After	98,4	95,8	0	85	41,7	62,9
#8	Before	0	0	0	15	0	3
	After	98,4	100	100	100	100	99,6
#9	Before	0	33,3	0	0	0	8,1
	After	93,9	58,3	0	98,3	95,8	66,8
#10	Before	0	0	0	0	0	0
	After	90,2	58,3	0	98,3	95,8	65,9
#11	Before	0	0	0	0	0	0
	After	0	58,3	0	0	0	6,1
#12	Before	0	0	5	5	0	2
	After	0	100	0	0	0	10,5
#13	Before	0	87,5	0	0	0	21,2
	After	88,5	100	0	58,3	0	49,3
#14	Before	10,5	0	85	50	0	29,3
	After	0	100	30	3,3	0	19,2

Interpretation of results

Some items described in ICS GUP on uroflowmetry are well fulfilled in daily clinical practice (>80%), like uroflowmetry indication (#1), trace without artifacts (#2), patients gender (#3), scale adapted to gender (#4), correct volume (#5), postvoid residual measurement (#6). The use of a checklist easily improves uroflowmetry quality (trace and report), especially in some items not usually included in daily practice, like reporting the time from micturition to PVR measurement (#7), labeling of a usual micturition (#8) or smoothing traces (#9), s or using a nomogram. However, some others, like rounding value or Qmaxraw, were not accepted in spite of ICS recommendations (#11 and # 12) and are very difficult to fulfill even using a checklist. Not all the items have the same clinical significance for uroflowmetry quality and preferences of the researcher should be considered. Item #4 (Scale adapted to patient´s gender) didn't convince some operators who refused to change; other #13 (Results shown as ICS standard), was partially implemented. Probably because some hospitals had their own more complete-preferred standard format; item #14 (Presence of a validated nomogram) depended on the machine; and items #1 (Uroflowmetry indication included in application form), #4 (Scale adapted to patient's gender) and #5 (Volume voided is acceptable) didn't change too much. They were well accomplished before intervention and/or did not depend on the operator.

It should be interesting to define an ideal checklist for daily practice.

Concluding message

A checklist is useful to improve global quality of free uroflowmetries (traces and reports). Not all ICS recommendation are well accepted. Uroflowmetry devices must be adapted for easier use of ICS standards.

Remains to be studied whether improvement in quality translates into clinical benefits.

References

1. Schäfer W et al, Neurourology and Urodynamics 2002, 21:261-271.
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