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GRADE OF NORMALCY IMPROVES INTER-RATERS' AGREEMENT IN THE INTERPRETATION OF UROFLOWMETRY

Hypothesis / aims of study
Because of low inter-raters' agreement on specific flow pattern and high inter-raters' agreement on bell vs. non-bell patterns, we developed a novel classification of uroflowmetry to improve inter-raters' agreement in interpreting uroflowmetry.

Study design, materials and methods
Uroflowmetry curves are classified as: grade 1 typical bell; grade 2 bell with significant fluctuations; grade 3 probably bell; and grade 4 non-bell which is further classified as interrupted, staccato, obstructive and plateau patterns. Definition of each grade and typical curves were taught to a junior urologist. First 50 consecutive curves were reviewed independently by the junior and senior urologist. Results of interpretation were compared and discussed to reach consensus. Then both reviewed another 50 curves independently again. Difference in one and two grades is regarded as minor and major difference, respectively. Difference in bell vs. non-bell pattern is regarded as major difference, and difference between abnormal patterns is regarded as minor difference.

Results
Mean age of the 100 patients was 67.8+/-13.1 years. Of the first 50 curves, 12 (24%) and 3 (6%) were minor and major grade difference; 5 and 6 were minor and major pattern difference. Of the second 50 curves 16 (32%) and 0 were minor and major grade difference; 9 (18%) and 7 (14%) were minor and major pattern difference.

Table 1. Inter-raters' difference in interpreting uroflowmetry curves in the first 50 curves.

	Number of curves	No grade difference	One point grade difference	Two point grade difference	Same pattern	Minor Pattern difference	Bell vs. non-bell difference
Voiding volume >150ml	38	29 (76.3%)	9 (23.7%)	0	31 (81.6%)	4 (10.5%)	3 (7.9%)
Voiding volume <150ml	12	6 (50%)	3 (25%)	3 (25%)	8 (75%)	1	3 (25%)

Table 2. Inter-raters' difference in interpreting uroflowmetry curves in the second 50 curves.

	Number of curves	No grade difference	One point grade difference	Two point grade difference	Same pattern	Minor pattern difference	Bell vs. non-bell difference
Voiding volume >150ml	28	18 (64.3%)	10 (35.7%)	0	19 (67.9%)	5 (17.9%)	4 (14.3%)
Voiding volume <150ml	22	16 (72.7%)	6 (27.3%)	0	15 (68.2%)	4 (18.2%)	3 (13.6%)

Interpretation of results
No major grade difference in these 100 patients suggests high inter-raters' agreement on grading system.

Concluding message
Using noval classification of uroflowmetry with grade of normalcy may improve inter-raters' agreement. Through teaching and practice, major grade difference can be avoided, while major pattern difference remained.

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