A PROSPECTIVE COMPARATIVE STUDY OF A MOBILE ACOUSTIC UROFLOWMETRY AND CONVENTIONAL UROFLOWMETRY

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Background: This study aimed to assess the performance of a mobile acoustic uroflowmetry application compared with standard uroflowmetry in the pediatric population.

Materials/Methods: A mobile acoustic uroflowmetry application represents a non-invasive method to estimate the urine flow rate by recording the voiding sound with a smartphone. Male pediatric patients who were undergoing uroflowmetry testing were prospectively recruited, and the voiding sound was recorded and analyzed. Intraclass Correlation Coefficient (ICC) was used to compare the maximal flow rate (Qmax), average flow rate (Qavg), voiding time (VT), and voiding volume (VV) as estimated by acoustic uroflowmetry with those calculated by standard uroflowmetry. Difference in Qmax, Qavg, VT, and VV between the two uroflowmetry were determined using 95% Bland-Altman limits of agreement.

Results: A total of 16 male patients were evaluated. The median age was 9 years. With standard uroflowmetry, the median Qmax, Qavg, VT, and VV were 18.7 mL/s, 11.1 mL/s, 15.2 s, and 157.8 mL, respectively. A strong correlation was observed between the two methods for Qmax (ICC = 0.755, p = 0.005), VT (ICC = 0.974, p < 0.001), and VV (ICC = 0.930, p < 0.001) but not for Qavg (ICC = 0.442, p = 0.135). The Bland-Altman plot showed good agreement between the two uroflowmetry tests. Flow patterns recorded by acoustic uroflowmetry and conventional uroflowmetry showed good visual correlation.

Conclusions: Acoustic uroflowmetry was comparable to standard uroflowmetry for male pediatric patients. Further validation of its performance in different toilet settings is necessary for broader use.

Images / Graph / Table

Figure 1. Visual correlation of representative flow patterns recorded by uroflowmetry and mUFM.