

Impact of Contrast Media on Urodynamic Parameters: A Comparison of Video Urodynamics and Standard Urodynamics

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Hypothesis / aims of study

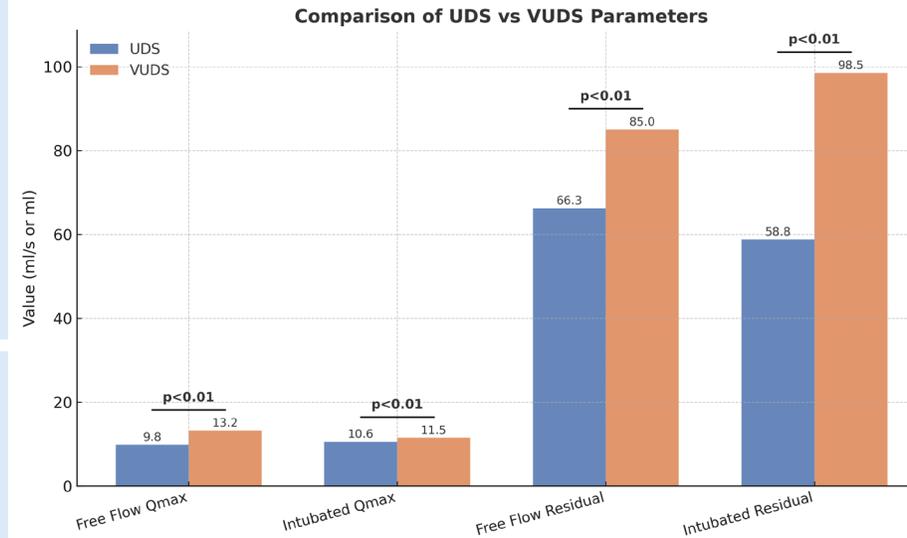
- Contrast media is required for VUDS (different density/viscosity than urine/saline).
- There have only been small studies reported at conferences investigating the effect of this difference on the urodynamic parameters [1,2].
- Hypothesis: difference between free flow and catheterised flow may vary between UDS and VUDS.
- Aim: compare mean free–catheterised flow difference in men undergoing UDS vs. VUDS.

Study design, materials and methods

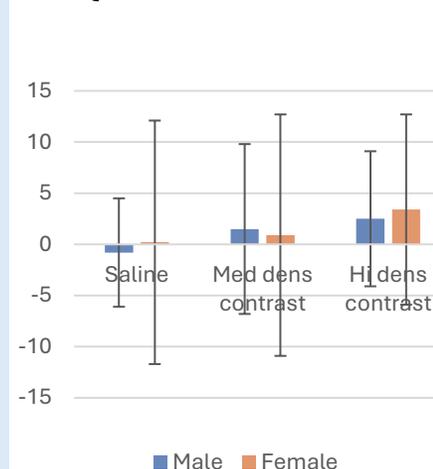
- Retrospective analysis of 1,596 male patients.
- All underwent free flow and catheterised studies.
- Compared Qmax differences (UDS vs. VUDS).
- Two-sample t-test, $p < 0.05$

Results

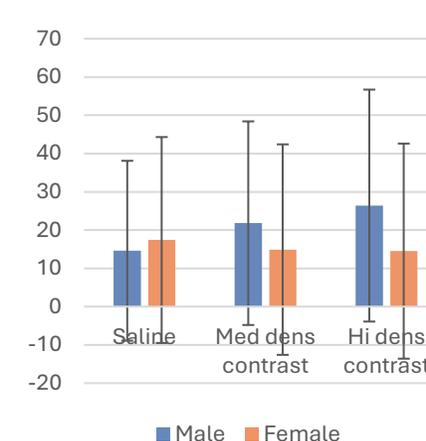
- **Qmax Reduction in VUDS:** A significant mean reduction in maximum flow rate (Qmax) was observed during VUDS catheterization (from **13.2 ml/s (± 7.5)** to **11.5 ml/s (± 5.3)**; $p < 0.01$).
- **Qmax Increase in UDS:** In contrast, standard UDS showed a slight mean *increase* in Qmax during catheterization (from **9.8 ml/s (± 7.5)** to **10.6 ml/s (± 5.6)**; $p < 0.01$).
- **Significant Difference in Qmax Change:** The magnitude of the Qmax reduction during VUDS was significantly greater than the change observed during UDS ($p = 4.29 \times 10^{-9}$).
- **Higher Residual Urine in VUDS:** Post-void residual urine volumes were significantly higher in VUDS under both free flow (**85 ml ± 52.8**) and intubated conditions (**98.5 ml ± 64.2**) compared to UDS (free flow: **66.3 ml ± 51.3** ; intubated: **58.8 ml ± 46.1** ; $p < 0.01$ for both).



Qmax difference Free - CMG



Liverpool % difference Free - CMG



Key Clinical Interpretation: Moving Beyond Qmax

- **Superior Analytical Approach:** Significant volumetric differences necessitate moving beyond standard Qmax analysis to the **Liverpool Percentile** nomogram for accurate interpretation.
- **Critical Finding in Men:** Contrast medium **density** is a key confounder, significantly altering nomogram position and potentially changing diagnoses.
- **Finding in Women:** The primary factor is the **intubation** itself, with contrast density playing a less critical role.

Interpretation of results

- Contrast media may reduce Qmax during voiding and increase residual urine volumes. The effect likely reflects both the viscosity of contrast and the influence of bladder volume.
- These findings suggest that contrast can significantly alter urodynamic parameters.

Concluding message

- Contrast in VUDS significantly reduced Qmax and increased residual urine compared to UDS.
- Qmax is volume-dependent, so additional analyses controlling for bladder volume are needed.
- Patients undergoing VUDS may represent a more complex population, warranting careful interpretation of results.

References:

1. Sullivan J et al. Does contrast medium affect the results of urodynamics? Proc ICS 1999, Poster 331, p 98–99.
2. Proc ICS 1979. Urodynamic implications of the differences in the viscosity of saline, urine and Urografin, p 211–215.