

Automatic Reference Height Correction For A Water-Filled Urodynamic System

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Introduction & Aims

ICS recommends the use of water-filled catheters to measure pressure in urodynamics [1]. However, when this method is used the external transducers must be placed at reference height throughout the study which is time consuming and difficult to estimate.

This pilot study trialled a new feature on the urodynamics system produced by Medica Menfis [2], which automatically corrects for changes in reference height by using a third transducer. The accuracy of both this feature and manually estimating reference height were compared.

Method

- 1) Each staff member estimated reference height on a model patient in 3 positions.
- 2) On 20 patients having standard urodynamics, the reference transducer was taped at bladder height (Figure 1) and its accuracy calculated.

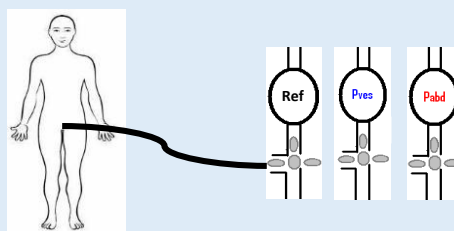


Figure 1. Third transducer measuring reference height taped to the patient at the level of the bladder.

Results

The manual estimation results (graph 1) showed a 3.5% error with a mean difference of 4.5cm (SD 3), this difference is statistically significant (p=0.0027).

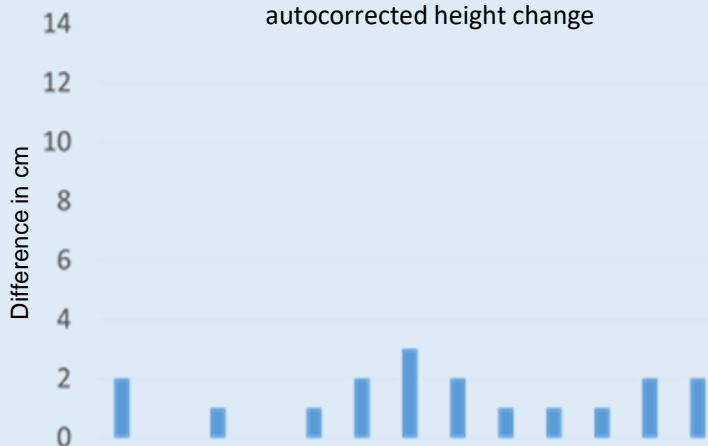
The automatic reference height results (graph 2) show a 3% error and mean difference of 1.5cm (SD 0.9), this difference is not statistically significant (p=0.3157).

Actual bladder height vs. manual estimation



Graph 1. Difference in actual bladder height and estimated bladder height using manual transducer placement

Actual change in reference height vs. autocorrected height change



Graph 2. Difference in actual bladder height and corrected difference made by the machine

Conclusion

The new feature measures changes in reference height accurately and eliminates the need for the transducers to be moved during the test.

References

- [1] Shafer, W. et al., 2002. Good Urodynamic Practices: Uroflowmetry, Filling, Cystometry and Pressure-Flow Studies. Neurology and Urodynamics, Issue 21, pp. 261-274
- [2] Medica Menfis, www.medica.it/menfis-division/urodinamica, Medolla, Italy

Disclosures

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