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AUTOMATIC REFERENCE HEIGHT CORRECTION FOR A WATER-FILLED URODYNAMIC SYSTEM

Hypothesis / aims of study

Good urodynamic practice recommends abdominal and vesical pressures are measured using a fluid filled system with external transducers [1]. This allows both zero pressure and reference height to be set accurately. However there are disadvantages to this method of measuring pressure. The external transducers must be at the same height as the patient's upper edge of the symphysis pubis at all times which is time consuming and difficult to estimate.

A new feature of the urodynamics system produced by Medica [2], aims to remove the need for external pressure transducers to be moved once the urodynamic study has begun. It does this by using a third transducer which is connected to the patient externally at bladder height. As a result, any change in bladder height is recorded and automatically corrected for on the vesical and abdominal pressure lines.

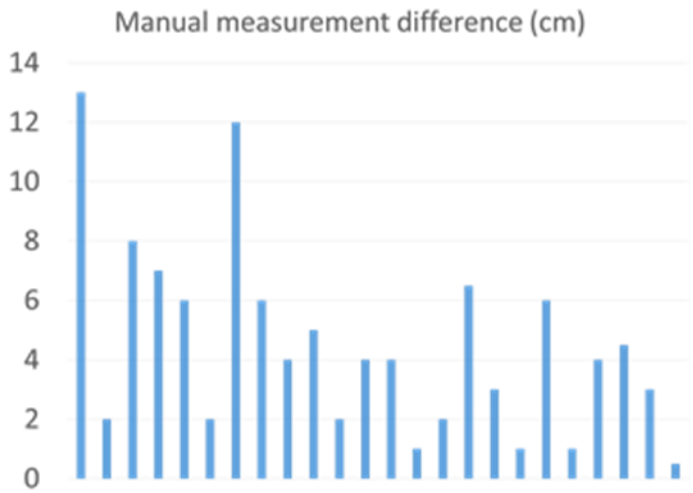
The aim of this study is to assess the usability and accuracy of the automatic reference height correction feature.

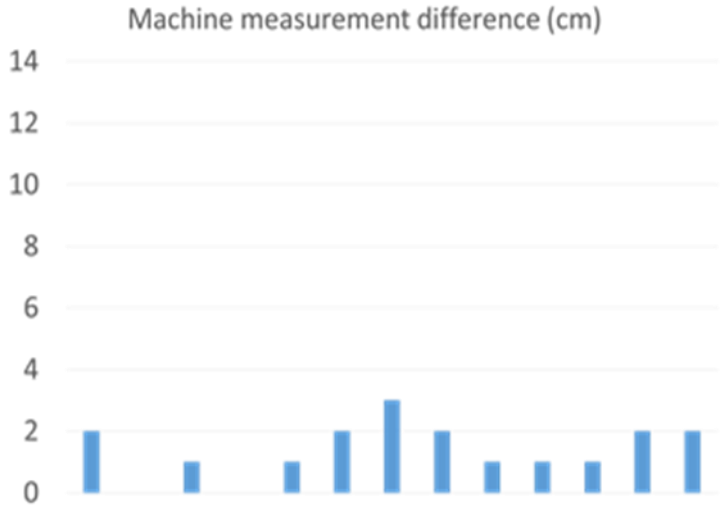
Study design, materials and methods

This pilot study trialled the usability of the equipment in 20 standard urodynamic tests. We also investigated the accuracy of the equipment at measuring reference height and compared this to how well it can be measured manually. To assess the accuracy of the equipment the height of each patient's symphysis pubis in the standing, seated and supine position was measured and compared to the change in height measured by the equipment. To assess how accurately reference height can be measured manually, a department staff member was used in place of a patient and their symphysis pubis height measured in the standing, seated and supine position. These measurements were then compared to the height the transducers were placed at by each staff member.

Results

Graph 1 shows the height difference between actual symphysis pubis height and manual placement of the transducers. Graph 2 shows the height difference between actual symphysis pubis height and the automatic measurement made by the urodynamic machine.





Interpretation of results

Analysis of the machines reference height recording showed a 3% error and mean accuracy of 1.5cm (SD 0.9). However, those measurements made by manual estimation showed a 3.5% error and a mean accuracy of 4.5cm (SD 3). It is worth considering that in practice, the patient is wearing fewer clothes and catheters have been inserted, hence it may well be easier to estimate the height of the symphysis pubis than in a fully clothed staff member.

Concluding message

To conclude, the new equipment accurately measures changes in bladder height and eliminates the need for the urodynamic practitioner to move the external transducers during the test making it easier to perform.

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.genmedhealth.com, 7 Trojan Business Park, Cobbold Road, London

Disclosures

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