Introduction

- Air-charged (AC) and water-perfused (WP) catheters have been evaluated for differences in measuring pressures for voiding dysfunction.
- We believe that a single, dual catheter, and the same experience clinician throughout the study will provide analogous point pressures for cough and valsalva movements in both AC and WP catheters when analyzed during cystometrogram (CMG).

Objective

To demonstrate the reproducibility of AC versus WP catheters when measuring stress point pressures, such as coughs and valsalva movements, in urodynamic studies.

Methods/Materials

- Female patients enrolled above the age of 21
- Complaints of lower urinary tract symptoms and were recommended urodynamic studies for further evaluation of symptoms.
- Commercially available AC catheter was utilized to form a dual catheter to simultaneously read water and air pressures within the bladder and urethra.
- Transducer evaluates water pressure and sends electrical signals to a urodynamic machine.
- The patient is evaluated with an empty bladder on CMG, followed by cough and valsalva maneuvers at bladder volumes of 50mL, 200mL, and functional maximum capacity.
- A comparative analysis was performed on the maximum stress peak pressures for valsalva movements and cough.

Results

- Forty women with a mean age of 57 years were recruited
- Significant correlations were observed between AC and WP pressures (Fig1, Fig 2)
- Trendline equations comparing AC and WP measurements over distinct bladder fill regions for cough and valsalva showed a high correlation (average R²=0.91).
- Average bias (4.7 cmH2O for coughs and 4.1 cmH2O for valsalva) throughout the measurements.
- Visual impression of the two overlying measurement methods shows virtually identical tracings (Fig 3)

Figure 1: Cough Peak Pressure Correlation at Various Infused Volumes – Air v. Water

Figure 2: Valsalva Peak Pressure Correlation at Various Infused Volumes – Air v. Water

Discussion

- The outliers on figure two are when the bladder was empty, and suggests the water pressure are not accurate until >50mL.
- Visual graphical impression of the two measurement methods correlated quite well and suggests that the clinical utility of either of these technologies is very similar and in some cases virtually identical.

Figure 3: Filling cystometry tracing at an infused volume of 200mL. Blue: P_ura_water, Red: Pves_air.

Conclusions

Cystometric pressures measured using air-charged catheters are comparable with water-filled catheters and clinically can be equally beneficial.

References


