561

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SHOULD WE USE A STANDARDISED OR A MAXIMAL VALSALVA FOR ASSESSMENT OF BLADDER NECK MOBILITY?

Hypothesis / aims of study

Measurement of bladder neck mobility during a Valsalva manoeuvre using ultrasound is an important tool in the assessment of pelvic floor function and the investigation of the incontinent patient. However there is little uniformity in the performance of this measurement, in particular with regard to the strength of the Valsalva. Should we use a standard Valsalva force or a maximal Valsalva? We do not know if a standard Valsalva force produces a similar rise in intra-abdominal pressure for all patients. Is the strength of a maximal Valsalva effort similar for all patients?

We aimed to determine intra-abdominal pressure response to a standard Valsalva force and to each patient's maximal Valsalva force. We also assessed the effect of bladder volume on that rise in intra-abdominal pressure. These results were used to develop the most appropriate method for evaluating bladder neck mobility.

Study design, materials and methods

Eighty female patients undergoing urodynamic assessment for incontinence (5Fr water filled rectal and vesical pressure lines) performed a series of Valsalva manoeuvres. Patients with greater than 2º prolapse were excluded as were those who could not produce a Valsalva force of 30 mm Hg. With the patient seated, rectal and intra-vesical pressures were recorded during a standardised Valsalva force of 30 mm Hg (patients blew into a modified sphygmomanometer). Measurements were performed with an empty bladder, at 100 mls and 200mls bladder volume. When possible measurements were also made at 300 mls. Rectal and intra-vesical pressure was then recorded during a maximal Valsalva manoeuvre – patients were instructed to blow as hard as possible into the sphygmomanometer tubing and the Valsalva force was documented.

Results

Using a Valsalva force of 30mm Hg, mean increased intra-abdominal pressure was similar regardless of bladder volume.

Rise in intra-abdominal pressure at increasing bladder volume using a standard 30mm Hg Valsalva force.

Bladder volume (mls)	Mean ↑intra-abdominal pressure (cm H2O) ± SD	Median ↑ intra-abdominal pressure (cm H2O)	Inter-quartile range (cm H2O)
0	28.7 ± 7.9	29	22-33
100	28.5 ± 7.9	30	23-34
200	29 ± 10.5	29	21-36
300	27.1 ± 8.9	26	21-31

Maximal valsalva force varied widely – mean 49.7 ± 14.8; range 30 – 88 mm Hg.

There was similar variability in the intra-abdominal pressure rises generated at maximal Valsalva – mean 54.3 cm H2O ± 21.9; range 16 137 cm H2O.

There was a statistically significant but clinically weak correlation between increasing Valsalva force and increased intra-abdominal pressure (P=0.004, r^2=0.23). The spread of values was greater at the higher Valsalva forces.

Mean patient age was 57.6 years (range 30 to 88 years). Increasing age correlated weakly with a lower maximal Valsalva strength (r^2=0.19) but there was no correlation between age and intra-abdominal pressure rise with maximal Valsalva.

Interpretation of results

For all patients the standard 30mm Hg Valsalva force generated a reasonably consistent rise in intra-abdominal pressure which was not significantly affected by bladder volume up to 300 mls. However the force produced with a maximal Valsalva effort and the resulting rise in intra-

abdominal pressure varied much more widely between patients particularly for Valsalva forces greater than 40mm Hg.

Concluding message

It may well be useful to measure bladder neck mobility in an individual patient using maximal Valsalva force . However, there is significant variation in the strength of a maximal Valsalva manoeuvre between patients. This, and the resulting inconsistent increase in intra-abdominal pressure, make maximal Valsalva an inaccurate method of comparing bladder neck mobility. We recommend the use of a standardised Valsalva force equivalent to 30-40 mm Hg for assessment of bladder neck mobility.