521

Watson A[1], Corden J[2], Hamamsy D[1], Reid F[1], Smith A[1]
1. *Warrell Unit St Marys Hospital Central Manchester University Hospitals NHS Foundation Trust,* ***2.*** *Trustech Central Manchester University Hospitals NHS Foundation Trust*

DEVELOPING A VALSALVOMETER; A DEVICE TO RAISE INTRA-ABDOMINAL PRESSURE

Hypothesis / aims of study

The Valsalva manoeuvre (VM) is a technique used to raise intra-abdominal pressure. VM is used in everyday clinical practice in the assessment of pelvic floor weakness. Patients often find it difficult to perform this manoeuvre. We are currently developing an easy to use non-invasive device (1) that enables patients to raise their intra-abdominal pressure (IAP) in a consistent and repeatable manner; our aim is to improve the diagnosis of pelvic floor weakness and urinary incontinence and establish reproducible measurements for assessments of new treatments.

Since the intra-abdominal cavity and the lungs are connected by the diaphragm it is possible that the IAP could be measured simply by measuring the pressure generated in the lungs when a patient performs the VM (forced expiratory pressure FEP). If there is a correlation between the IAP and the FEP then it will be possible to establish IAP from the FEP when the patient blows into the Valsalvometer device which is simply a closed tube containing a pressure sensor.

Hypothesis: There is a correlation between forced expiratory pressure (FEP) and intra-abdominal pressure (IAP).

Study design, materials and methods

Ten healthy female volunteers were asked to perform the valsalva manoeuvre (VM) by blowing into a manometer. Standardised instructions of how to perform the manoeuver were given. The VM was performed three times in standing and supine positions. Allocation to positions was randomly assigned. Intra-abdominal pressures were recorded using a rectal balloon catheter (TDoc). We were advised by a statistician that as the study was a pilot consisting of a small number of cases no formal sample calculation was required.

Results

There is a significant correlation between FEP and IAP for both standing and supine R=0.77 and 0.92 respectively, $p<0.05$. Figures 1 and 2 show the mean (and standard deviation) FEP and IAP pressures for standing and supine.

Interpretation of results

The results show that there is a significant correlation between the forced expiratory pressure generated by the lungs and intra-abdominal pressure. It will therefore may be possible calculate the IAP from the FEP.

Concluding message

The results of this study indicate that it should be possible to accurately determine intra-abdominal pressure during clinical assessments of pelvic floor weakness (PFW) using a simple oral device (the Valsalvometer). This will enable easier and reproducible assessment of PFW. It will also enable PFW to be determined in general practice settings in addition to specialist centres. Reproducible quantification of PFW will enable the efficacy of interventions on patients with PFW to be determined during their treatment.

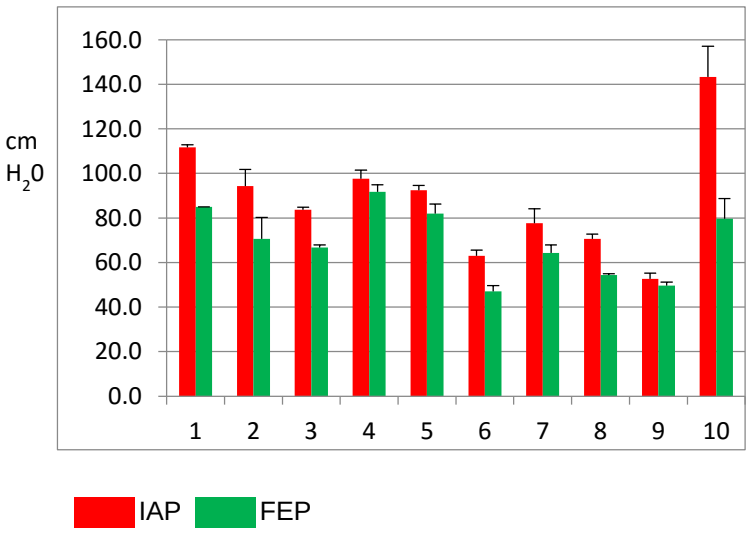

Figure 1 Standing IAP & FEP pressures

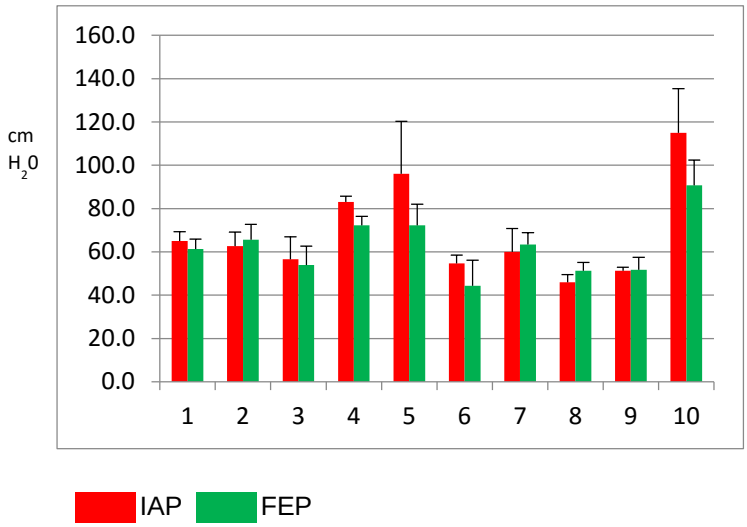

Figure 2 Supine IAP & FEP pressures

References

1. Greenland HP, Hosker GL, Smith AR A valsalvometer can be effective in standardising the Valsalva manoeuvre. Int Urogynecol J Pelvic Floor Dysfunct. 2007 May;18(5):499-502

Disclosures

Funding: This research was funded by a 20K grant from CMFT charitable funds. **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** North West - Greater Manchester West Research Ethics Committee: No. 15/NW/60. **Helsinki:** Yes **Informed Consent:** Yes