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VLPP IN WOMEN: COMPARISON IN TOTAL VESICAL PRESSURE AND INCREASE OVER BASELINE ABDOMINAL PRESSURE IN DIFFERENT POSITIONS

Aims of Study

The Valsalva Leak Point Pressure (VLPP) is one of the most investigated and controversial tests, with many reports of variations in its methodology, mainly because soon after the original technique with fluoroscopy and the patient in the upright position was proposed by McGuire in 1993, operators began adopting it during cystomanometry and consequently modified it considerably. They used the gynaecological position and smaller catheters, observed urinary leaking from the external urethral meatus, calculated pressure differences rather than total pressure etc. This study investigated the VLPP in women by measuring increases over baseline abdominal pressure and the total bladder pressure in the gynaecological and upright position.

Methods

35 consecutive patients with stress urinary incontinence (SUI) underwent a full urogynaecological work-up which included case history, clinical examination with assessment of vaginal profile sec. Baden and Walker, multichannel cystometry with Pressure/Flow study, Urethral Pressure Profile, VLPP. the VLPP was performed in the gynaecological and then in the upright position. The lowest increase over baseline abdominal pressure (ΔVLPP) during Valsava's manoeuvre was recorded in each position. Then the total bladder pressure ($VLPP_{tot}$) during Valsava's manoeuvre was recorded in each position. The bladder was filled to a volume of 200cc and a 7 Fr catheter was used. A remote control device recorded the bladder pressure exactly when urine appeared at the external urinary meatus. Without urinary leakage the VLPP was considered negative and the maximum bladder pressure achieved during the Valsalva manoeuvre was registered. A cut-off of $\leq$ 60 cm H2O was chosen to diagnose Intrinsic Sphincter Deficiency as suggested by McGuire. Statistical analysis: Spearman rank correlation coefficient measured the relation between ΔVLPPand $VLPP_{tot}$ test values. Cohen's K test was used to assess agreement between ΔVLPP and $VLPP_{tot}$ test results (patients correctly classified in both tests on the basis of VLPP cut-off).

Results

Mean age of patients was 58 years. Two had previously undergone uro-gynaecological surgery. Grade >2 incontinence was present in 22 (68%). Mean number of daily pads was 2.16. No patient presented with cystocele > grade 2. All four VLPP readings were negative in 6 patients and positive in 24. Median ΔVLPP in the upright position was approximately 10 cmH_2O lower than in the gynaecological. Readings were lower in 83% of patients in the upright position. Median $VLPP_{tot}$ in the upright position was approximately 14 cmH_2O higher than in the gynaecological. Readings were markedly higher in 80% of patients. The Spearman test shows a good correlation between ΔVLPP and $_{tot}$VLPP, in both positions (tab. I).

Tab. I

	Gynaecological position	Upright Position	r	P
ΔVLPP cm H_2O 24 pts	68 (40-127)*	60 (8-134)*	**0.758**	**0.000**
$VLPP_{tot}$ cm H_2O 24 pts	81,5 (33-175)* 7(2-20)°	95,5 (13-176)* 41(25-70)°	**0.815**	**0.000**
R	**0.799**	**0.857**		
P	**0.000**	**0.000**		

* median and range of VLPP.
° median and range of baseline abdominal pressure.
r= Spearman correlation coefficient.

Tab. II shows that with 60 cm H_2O as cut-off, the K test showed good agreement when ΔVLPP and $VLPP_{tot}$ were compared in the gynaecological position (k=0.78) and sufficient/moderate when compared in the upright position (K= 0.46); good agreement when VLPP was compared in each position (K= 0.60 and K=0.61 respectively).

Tab. II

	Gynaecological position	Upright Position	K
VLPPΔ cm H2O	9 pts ≤ 60 cm H2O (25.7%)	14 pts ≤ 60 cm H2O (40.0%)	**0.60**
VLPPtot cm H2O	11 pts ≤ 60 cm H2O (31.4%)	6 pts ≤ 60 cm H2O (17.1%)	**0.61**
K	**0.78**	**0.46**	

Conclusions

Agreement was best between ΔVLPP and $VLPP_{tot}$ in the gynaecological position. When VLPP was measured using total bladder pressure in the upright position levels were higher and fell below the cut-off in only 6 patients. Although Spearman's test showed all measurements were well correlated, agreement was only moderate between upright positions. The impact of resting bladder pressure, with its great inter-individual variations due to its links with body type, could account for the divergency in results. When the patient moves into the upright position added bladder volume could contribute to raise pressure even though patients leak more easily when standing, as shown by the low ΔVLPP in this position. The role of resting bladder pressure in sphincter deficiency remains an open question. Rises above baseline abdominal pressure could overcome sphincter resistance during stress or the total bladder pressure could act in full upon the sphincter.

References

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