

VALSALVA LEAK POINT PRESSURE AND THE ROLE OF PELVIC FLOOR MUSCLES**Aims of Study**

Valsalva Leak Point Pressure (VLPP) evaluation requires some expertise because there may be several pitfalls. During evaluation patients with intrinsic sphincter deficiency may voluntarily contract the striated sphincter, artificially increasing the leak point pressure (1). Two recent studies reported that the intra-abdominal pressure causing stress urinary incontinence (SUI) was higher during coughing than during Valsalva as there was no simultaneous reflex contraction of the pelvic floor muscles (2). The exact role of pelvic floor muscles (PFM) during VLPP measurement is not well known so the aim of this study was to investigate PFM behaviour during VLPP examination in patients with SUI, and to detect whether VLPP is influenced by voluntary PFM control of the patients.

Methods

39 patients (14 males and 25 females) complaining of SUI underwent VLPP evaluation. This was performed with a simultaneous recording of EMG activity of PFM by means of surface electrodes. After appropriately filling the bladder, patients were placed in an upright position, vesical and abdominal pressures were set at zero and they were asked to strain down slowly to perform a Valsalva maneuver. This was repeated three times and during the final maneuver patients were asked to strain while inducing a simultaneous PFM relaxation. As soon as leakage occurred, an event marker was placed with the lowest result used for evaluation. Patients were classified based on VLPP value (3). VLPP under two different conditions were analyzed: during spontaneous Valsalva maneuver (Test A) and during Valsalva with simultaneous relaxation of the PFM (Test B). We investigated mean duration and amplitude of EMG activity of PFM at rest and during both tests and maximum abdominal or vesical pressure (pMax) in the absence of urinary leakage during both tests. We also checked if the diagnosis of type II or III SUI (3), obtained in test A, changed in test B. Statistics: Kolmogorov-Smirnov, Mann-Whitney and Wilcoxon tests were used. The significance level was set at $p < 0.05$.

Results

(Tab 1.) A simultaneous contraction of the PFM during VLPP was observed in 92 % of patients during both tests. We observed a significant reduction in amplitude of EMG activity during Test B, as compared to test A (significant in females but not in males). Furthermore, there was a reduction in vesical or abdominal pMax in Test B as compared to Test A, significant in females but not in males. Ultimately, there was no significant difference in the number of patients reporting urinary leakage during test A (14 patients) and test B (14 patients), nor in VLPP values between the two tests. Only 2 patients with a diagnosis of type II SUI in test A changed to type III in test B.

Patients		Total number	Males	Females
EMG at rest	μV : mean value	138 ± 3.1	137.3 ± 3.3	138.4 ± 3
EMG Test A	"	167 ± 40.2	150.6 ± 12.9	175.8 ± 47
Δ -A	"	$28.7 \pm 39.5^*$	13.2 ± 11.6	$38 \pm 46.6\text{§}$
EMG test B	"	156.5 ± 46.2	145.2 ± 6.2	162.8 ± 56.9
Δ -B	"	18.4 ± 45.7	7.8 ± 5.8	24.3 ± 56
EMG duration Test A	sec : mean value	4.33 ± 1.6	4.2 ± 1.4	4.4 ± 1.7
EMG duration Test B	"	4.3 ± 1.5	4.3 ± 1.9	4.3 ± 1.3
pMax test A	cm H ₂ O : mean value	$96 \pm 35.7^{**}$	99 ± 43	94 ± 32
pMax Test B	"	80.7 ± 34.2	86.1 ± 35.6	78 ± 34
VLPP Test A	"	72.5 ± 39.6	77 ± 43.8	67.3 ± 37.4
VLPP Test B	"	68.8 ± 33.9	70.2 ± 36	76.1 ± 34.7

Tab. 1 Δ -A: difference between EMG activity during Test A and at rest.
 Δ -B: difference between EMG activity during Test B and at rest.
 * Between Δ -A and Δ -B: $p < 0.01$; ** Between pMax in Test A and B: $p < 0.01$.
 § Between Δ -A in males and females: $p = < 0.05$

Conclusions

Contrary to data previously reported (2), our results show that during a slow abdominal strain (Valsava), there is a reflex contraction of PFM. It may indicate an augmented guarding reflex, or it could indicate that patients voluntarily contract the striated sphincter and the PFM (Blaivas), so increasing the leak point pressure, as showed in Test A. Patients can avoid this voluntary contraction and relax the PFM, with a significant reduction in maximum vesical or abdominal pressure, as shown in test B. As VLPP values do not change significantly, we conclude that any voluntary contraction during Valsalva manouver does not increase the leak point pressure. Finally our data show that PFM behaviour in females differs from that in males, possibly because of the more effective voluntary control in females.

References

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