

THE EFFECT OF VAGINAL DISTENSION ON VAGINAL TOPOGRAPHY AND URETHRAL FUNCTION IN THE RAT

Aims of Study

To characterize morphologic changes in the rat vagina after vaginal distension (VD) and to determine if leak point pressures (LPP) done 7 days after VD were related to pressures in the distending balloon

Methods

Twenty-six female Sprague-Dawley rats underwent one of 3 VD protocols using a 10 Fr Foley catheter – 10 sham VD (no inflation of balloon), 8 high pressure, low volume (2cc volume), and 8 high volume, low pressure (3cc volume). A suprapubic catheter was implanted 5 days after VD and LPP testing was done 7 days after VD. The diameter of the vagina and anal sphincter (EAS) and amount of perineal descent were recorded before, during, and immediately after VD. LPP testing was done supine after the rats were anesthetized with urethane. Bladders were filled with saline at 5ml/hr, and vesical pressure was measured through the suprapubic catheter. LPP were determined by manually increasing pressure over the bladder until a drop of urine was noted at the urethral meatus. The vesical pressure at the precise moment of leakage was the LPP. A mean of the 3 LPP values in each was used. Statistical analysis included a t-test for LPP data and Kruskal-Wallis test for non-normally distributed data.

Results

Mean balloon pressure during VD was significantly different between groups - 0 in sham, 619mmH₂O (232-788) in 2cc group, and 309cmH₂O (176-478) in 3cc group, p=.021. All morphologic changes recorded during VD were also significantly different between groups.

	Sham	2cc	3cc	P-value
EAS diameter during VD (mm)	.43 ± .04	.90 ± .11	1.8 ± .17	<.0005
Vaginal diameter after VD (mm)	3.8 ± .27	6.7 ± .15	7.6 ± .45	<.0005
Perineal descent (mm)	0	.75 ± .14	3.5 ± .32	<.0005

There was not a significant difference in LPP measurements between the groups. Mean LPP of the shams was 56cmH₂O (20-100), 2cc group was 53 cmH₂O (34-72), and 3cc group was 52 cmH₂O (37-70).

Conclusion

Morphologic changes during VD in the rat vagina, EAS, and perineum are greater using a large volume balloon at lower pressure. However, there is no difference in LPP 7 days after VD regardless of the volume or pressure in distending balloon. Previous studies have shown significantly decreased LPP in rats 4 days after VD, suggesting that functional changes are temporary and recover quickly.