369

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COMPARISON OF URETHRAL PRESSURE PROFILES BETWEEN NULLI PAROUS AND EX-BREEDER ANAESTHETISED BEAGLES.

Hypothesis / aims of study

Urethral pressure profiles (UPP) have been studied in women as a diagnostic tool for Stress Urinary Incontinence (SUI). It is accepted that aging female dogs suffer from a similar condition (1). This study was designed to investigate the differences between UPP's of young (< 1 year) nulli parous and aged multi parous female beagles. Furthermore, does the ex-breeder beagle provide a patho-physiological model of SUI?

Study design, materials and methods

Studies were performed with female beagles (10 – 20kg) and were conducted in accordance with United Kingdom legislation.

UPP's were evaluated in nulli parous (n=6) and ex-breeder (n=6) beagle dogs, anaesthetised with sodium pentobarbitone (bolus dose of 30mg kg^{-1}) and maintained with α-chlorolose / borax (1% w/v, 1ml kg^{-1} hr^{-1}). The right brachial vein and artery were cannulated for maintenance of anaesthesia and blood pressure monitoring. To maintain a closed urinary system both ureters were cannulated and urine collected. The bladder was cannulated and filled to 60% capacity. A Millar (8F) pressure transducer was placed into the bladder via the external meatus and UPPs were conducted repeatedly at a withdrawal speed of 1cm min^{-1}. Urethral parameters measured included peak urethral pressure (PUP), closing pressure, area under curve (AUC), intra-vessical pressure (mmHg) and functional urethral length (FUL).

Results

	Nulli parous		**Ex-breeder**		**p - value**
	Mean	**sem**	**Mean**	**sem**	
Intra-vessical Pressure (mmHg)	7.97	0.88	4.88	1.01	0.03
PUP (mmHg)	25.6	0.93	22.4	1.66	0.103
Average Pressure (mmHg)	17.83	0.66	13.83	1.19	0.005
Closing Pressure (mmHg)	20.3	0.72	15.48	1.19	0.001
FUL (s)	206.3	6.34	272.1	10.16	0.000
MAP (mmHg)	119.47	7.16	143.15	7.16	0.18
HR (bpm)	129.7	2.22	124.3	2.12	0.005

Interpretation of results

Significant differences were observed in intra-vessical pressure, closing pressure and functional urethral length. However, no significant difference was observed for peak urethral pressure between nulli parous and multi parous dogs. A significant decrease in urethral tone was recorded in the distal urethra, as determined by the closing pressure in multi parous dogs. Furthermore, average urethral pressure was significantly decreased in these animals suggesting changes in urethral tone with age and / or parity. It is plausible to suggest from the present study that the increase in functional urethra length, no change in peak urethral pressure and decrease in bladder pressure are compensatory mechanisms in the multi parous dog in an attempt to maintain continence.

Concluding message

The results from the present study suggest that the ex-breeder beagles may provide a model of SUI, as the average urethral and closing pressures in these animals is significantly less than corresponding nulli parous dogs.

References

(1) Comparison of stressed simultaneous urethral pressure profiles between anaesthetised continent and incontinent bitches with urethral sphincter mechanism incompetence. (1993) Am J Vet Res. Feb **54**(2):216-22.