

## URODYNAMIC EFFECT OF ACUTE ADMINISTRATION OF SILDENAFIL ON LOWER URINARY TRACT OF RATS.

### Hypothesis / aims of study

The acute effects of Phosphodiesterase (PDE5) inhibitors have not been studied thoroughly. Therefore, the aim of this study was to observe the effects of acute administration of sildenafil in the detrusor of rats with urodynamic study.

### Study design, materials and methods

Twenty-seven adult Wistar rats were separated in four groups. In Group 1 had nine rats which were the control group. In Group 2 had eight rats which were administered L-Nitro-Arginine Methyl Ester (L-NAME) 60mg/kg/day dissolved in water for 30 days. In Group 3 had four rats who were administered sildenafil (100ug/Kg intravenously) acutely. In Group 4 had six rats which were administered L-NAME (60mg/kg/day) dissolved in water for 30 days followed by acute intravenous infusion of sildenafil (100ug/Kg). All animals underwent to anesthetized cystometrograms.

The animals in the Group 1 were compared to Group 2 to evaluate if nitric oxide (NO) deprivation causes detrusor overactivity. Group 3 was compared to Group 4 to evaluate the effect of acute administration of sildenafil in the lower urinary tract of rat with lower level of NO.

### Results

Comparing Group 1 with 2, the chronic and systemic administration of L-NAME resulted in a significant increase in non voiding contractions, volume threshold and frequency of micturition cycles. (Table 1)

Comparing Group 3 with 4 from the baseline to end point, it was observed a significant difference between the groups in relation to frequency of micturition and amplitude (lower values in the Group 4 after sildenafil administration). (Table 2)

Table 1. Descriptive and comparative analyses of continuous variables between Groups 1 and 2.

Group 1				Group 2				P
Variable	N	Median	SD	Variable	N	Median	SD	
NVC (N/min)	9	0.98	0.75	NVC (N/min)	8	2.71	0.89	0.004
VT (mmHg)	9	1.26	0.38	VT (mmHg)	8	2.80	1.64	0.012
PT (mmHg)	9	17.60	3.02	PT (mmHg)	8	19.20	2.90	0.860
PP (mmHg)	9	20.80	3.06	PP (mmHg)	8	20.55	2.93	0.555
FM (N/min)	9	1.20	0.65	FM (N/min)	8	1.79	0.78	0.05
BP (mmHg)	9	12.30	6.77	BP (mmHg)	8	15.05	3.35	0.906
Weight (g)	9	332.00	7.75	Weight (g)	8	335.00	7.95	0.335

p-values refer to Mann-Whitney test for comparison between the Groups 1 and 2. SD – Standard deviation.

NVC – Non voiding contractions; VT – volume threshold; PT – pressure threshold; PP – peak pressure; FM – frequency of the micturition cycles; BP – baseline pressure during micturition

Table 2. Descriptive and comparative analyses of continuous variables between the Group 3 and 4.

Group 3				Group 4				
Variable	N	Median	SD	Variable	N	Median	SD	P
Weight (g)	4	328.50	5.91	Weight (g)	6	320.00	24.03	0.330
FM baseline (N/min)	4	1.23	0.37	FM baseline (N/min)	6	1.37	0.37	0.831
Amplitude baseline (mmHg)	4	8.50	3.16	Amplitude baseline (mmHg)	6	27.00	8.73	0.025
FM end point (N/min)	4	1.30	0.15	FM end point (N/min)	6	0.35	0.25	0.010
Amplitude end point (mmHg)	4	9.00	2.99	Amplitude end point (mmHg)	6	7.50	6.60	0.668

\* p-values refer to Mann-Whitney test for comparison between the Group 3 and 4.

#### Interpretation of results

It was hypothesized that PDE5 inhibitors may exert their effects probably via bladder. Therefore, the observation that the acute administration of sildenafil relaxes the detrusor in the present study supports this hypothesis.

#### Concluding message

The systemic reduction of nitric oxide causes detrusor overactivity and acute administration of sildenafil relaxes the detrusor muscle.

#### References

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#### Disclosures

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