

The effect and mechanism of change in neuro-receptors in the bladder and skin with ovariectomized rats

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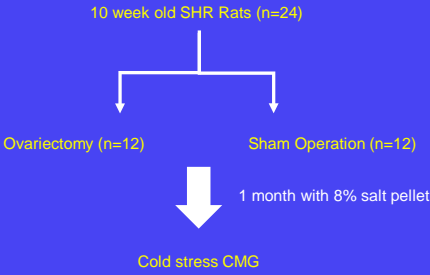
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Hypothesis / aims of study

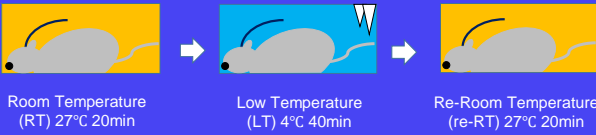
Menopause is a condition that almost all women experience in their lifetime. Decreased secretion of estrogen from the ovary influences the whole body and causes many symptoms. Osteoporosis, arteriosclerosis is a major concern and are treated heavily. However, symptoms that influence their quality of life have not yet been focused enough. Menopause women experience hot flash, which causes major sweat, but they sometimes experience hypersensitivity to cold environment, which causes Lower urinary tract symptoms (LUTS), such as urinary urgency, frequency, and nocturia. Cold stress produced by sudden change or continuous exposure to low temperature exacerbates LUTS. The mechanism of such symptoms have been proven to appear due to activation of the c-fibers in the bladder and TRPM8 channels in the skin. From this theory, we hypothesised that menopause women`s neural receptors in the bladder and skin has a difference compared to premenoausal women. The aim of this study is to discuss cold stress related LUTS in ovariectomized rats and to see the neural receptor expression in the bladder and skin.

Study design, materials and methods

A total of 24 female spontaneously hypertensive rats (160-180g) and 12 female Sprague-Dawley(SD) rats at postnatal week 10 were used for the experiments.

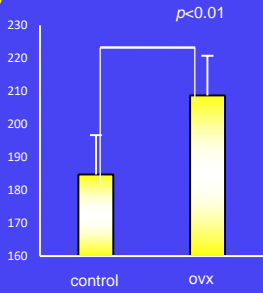


Four weeks later, the rats were anesthetized and the urinary bladder was exposed and incised at the center of the dome. A polyethylene catheter was inserted and the free end was tunneled subcutaneously and exteriorized at the back of the neck. Three days after cannulation, the rats underwent cystometography (CMG) unanesthetized.



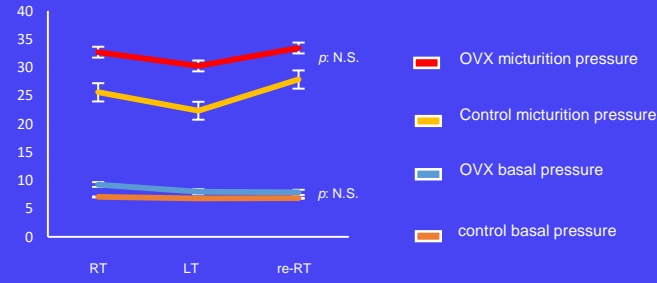
Basal pressure and micturition pressure of the bladder were measured. Voiding volume and interval were also measured to see the change rate between RT and LT. After CMG, the whole bladder and dermis of the skin of 10 week old SHR rats were removed for real time PCR and immunohistochemistry to see the effect of ovx against neuromechanism in the bladder and skin.

Body Weight



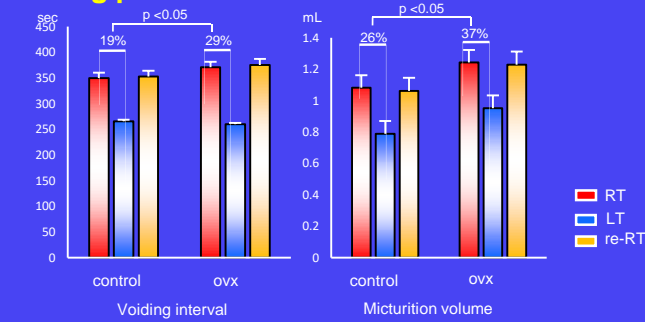
OVX rat`s body weight were significantly higher than control rats.

Bladder pressure



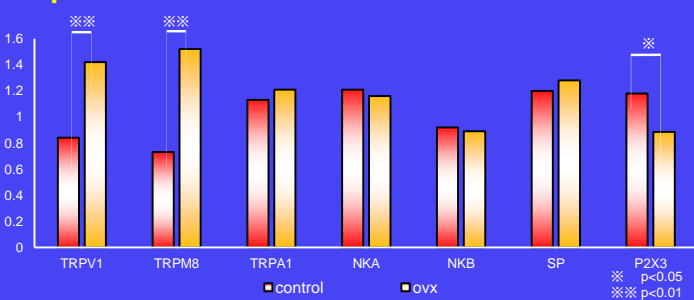
Bladder pressure did not show any difference between both rats.

Voiding pattern



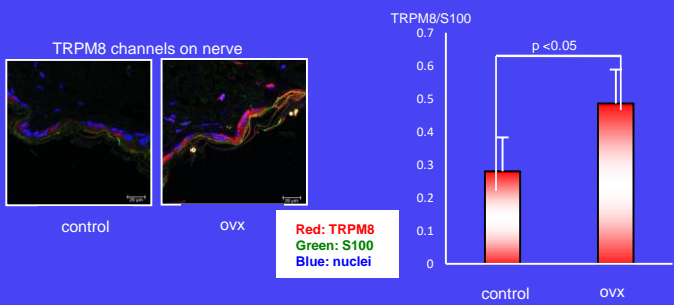
Change rate of voiding patterns were higher in ovx rats.

Expression of neurochemical factor`s m-RNA



TRPV1 and TRPM8 showed an increase in ovx rats.

Immunohistology of the skin



TRPM8 channels increased significantly in ovx rats.

Conclusion

- OVX is a factor of increased cold stress induced frequency in SHR rats
- OVX in SHR rats increase neurochemical receptors in the bladder and skin.

	RT			LT		
	control	ovx	p vallue	control	ovx	p vallue
basal pressure (mmHg)	9.3	7.1	N.S	7.9	6.8	N.S
micturition pressure (mmHg)	32.7	25.6	N.S	30.3	22.3	N.S
voiding interval (sec)	349	370	N.S	266	260	N.S
micturition volume (ml)	1.08	1.24	N.S	0.789	0.952	N.S
change rate in cold stress						
	control	ovx	p vallue			
voiding interval (%)	19	49	0.01			
micturition volume (%)	27	37	0.04			