INCREMENTED CONNEXIN-43 EXPRESSION AS A MECHANISM OF OVERACTIVE BLADDER IN OVARIECTOMIZED RATS.

Hypothesis / aims of study
After menopause bladder is known to become overactive. We investigated the changes of gap junction protein Connexin-43 and muscarinic receptors M2, M3 in ovariectomized rat bladder.

Study design, materials and methods
20 ten week old female SD rats were used. 10 rats were ovariectomized (OVX group) and 10 rats were received sham operation (CON group). Four weeks after operation, urodynamic tests were done and the animals were sacrificed. Body weight and bladder, uterus weight were measured. The bladder specimen was prepared for conventional H&E stain, immunohistochemical staining for muscarinic receptors M2, M3 and connexion-43. Western blotting was used for the same proteins (M2, M3 and connexion-43) measurement Image J was used for the evaluation of intensity of immunohistochemical staining expression and SPSS 12.0 for Windows, Mann-Whitney test with P-value of 0.05 was used.

Results
The body weight of OVX group (315.8 ± 18.1) was larger than CON group (270.0 ± 23.6) (p=0.009). The uterus weight of OVX group (260.4 ± 186.8) was smaller than CON group (600.6 ± 175.9) (p=0.028) and bladder weight of OVX group (80.2 ± 15.9) was smaller than CON group (97.4 ± 10.6) (p=0.041). The frequency of contraction of OVX group (5.45 ± 2.34/10min) was larger than CON group (3.48 ± 2.75) (p<0.05). The expression of M2 and M3 was not different between OVX and CON group. The expression of connexin-43 of OVX group (110.7 ± 15.7) was more intense than that of CON group (91.4 ± 9.5) (p<0.05) in immunohistochemical staining and western blotting result was same (pic 1.)

Interpretation of results
Ovariectomized rats gain more body weight and less bladder weight with rudimentary uterus. Ovariectomy induced more frequent bladder contraction in rats and about the changes of candidate proteins explaining the mechanism of overactive bladder, M2 and M3 showed no difference. Increased connexion-43 can lead to easy coupling of muscle cells and can explain the functional augmentation of muscarinic receptor despite of no change in receptor expressions.

Concluding message
Ovariectomized rats showed frequent bladder contraction and increased connexin-43 expression without the change of M2, M3 receptor expression.

Fig 1. Expression of connexin-43 of ovariectomy group increased more than control group 4 weeks after operation.

Disclosures
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