

INCREASED 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 connexin-43. Western blotting was used for the same proteins (M2, M3 and connexin-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 ($5.45 \pm 2.34/10\text{min}$) 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 connexin-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.

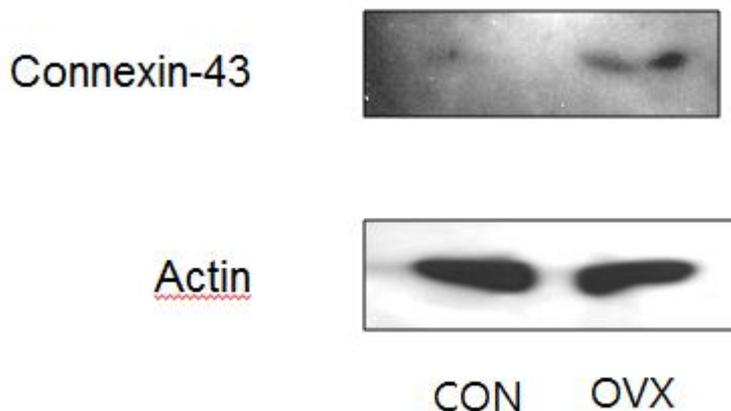


Fig 1. Expression of connexin-43 of ovariectomy group increased more than control group 4 weeks after operation.

Disclosures

Funding: Inje University **Clinical Trial:** No **Subjects:** ANIMAL **Species:** Rat **Ethics Committee:** Ilsanpaik Hospital Animal Care and Use Committee