

## ESTROGEN DEFICIENCY ENHANCES URETHRAL RELAXATION AND CHANGES CONTRACTILE PROPERTIES OF THE DETRUSOR IN MULTIPAROUS RABBITS

### Aims of Study

A number of investigators have reported functional changes of the bladder and the urethra following estrogen manipulation. But these studies are usually done on young and virgin animals, which do not match the clinical situation. Naturally occurring estrogen deficiency, i.e., menopause, usually appears in women years after giving birth. This study is designed to imitate genuine clinical circumstances using multiparous rabbits.

### Methods

Twelve female rabbits with a mean age of 29.6 months and have given birth for  $5.1 \pm 1.6$  times are used for the experiment. These animals received sham surgery (N=6) or bilateral ovariectomy (N=6) 11.4 months (mean) following the last delivery. One month after the surgery, we isolate strips of bladder body, bladder neck and the urethra. Following stimulations are applied to strips: electrostimulation, 120mMKCl, bathanechol, phenylephrine. We also investigate electrostimulation-induced relaxation of urethra strips, which have been pre-contracted by phenylephrine. We use high performance liquid chromatography (HPLC) to determine the tissue content of high-energy phosphates.

### Results

Ovariectomy on multiparous rabbits reduces the contractile response of bladder body to electrostimulation and KCl, but without affecting the response to bathanechol. (Figure 1) The contractile responses of bladder neck and the urethra to electrostimulation, KCl and phenylephrine are not influenced by ovariectomy. Interestingly, nitric oxide-related relaxation of the urethra is more pronounced in the ovariectomy group. (Figure 2) Ovariectomy does not change the content of phosphocreatine and ATP in bladder body, bladder neck and the urethra.

### Conclusions

Estrogen deficiency in multiparous rabbits enhances urethral relaxation and reduces nerve-mediated detrusor contraction. These changes may increase the risk of developing urinary incontinence.

Figure 1: Bladder Body

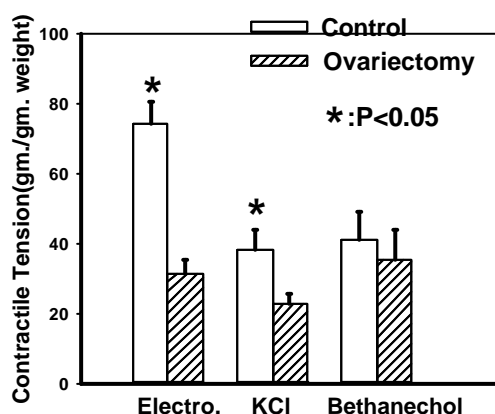


Figure 2: Urethral Relaxation

