

## THE EFFECTS OF HERBAL EXTRACTS COMPLEX INCLUDING CORNELIAN CHERRY(KH-204) ON PARTIAL URETHRAL OBSTRUCTION INDUCED DETRUSOR OVERACTIVITY IN RATS : ON THE ASPECTS OF NITRIC OXIDE PATHWAY AND OXIDATIVE STRESS

### Hypothesis / aims of study

The nitric oxide pathway is correlated to BPH/LUTS by various evidences<sup>1</sup>. Previous study explained that herbal formula KH-204 may be attributed to its antioxidant effects or to an elevation in NO-cGMP activity<sup>2</sup>. We investigate the effects of herbal formula KH-204 on partial urethral obstruction induced detrusor overactivity.

### Study design, materials and methods

KH-204 was consisted of 5 seed of 5 different kinds of berry plants; It included *Cornus Officinalis* Sieb. Et Zucc (32%), *Lycium chinense* Mil (32%), *Rubus coreanus* Miguel (16%), *Rubus coreanus* Miguel (16%), and *Schizandra chinensis* Baillon (4%). 24 Sprague-Dawley rats were randomly assigned to four groups; Sham-operated(control), partial urethral obstruction<sup>3</sup> induced detrusor overactivity(overactive), solifenacin(0.03mg/kg) treated overactive, KH-204(200mg/kg) treated overactive. Control and overactive group were administered distilled water for 4 weeks and solifenacin and KH-204 group was treated each medication for 4 weeks. After treatment, all rats were performed cystometrography and after that, each groups were sacrificed and obtained bladder tissue for identifying muscarinic receptor, eNOS, RhoA, Rock-1,2, 8-OHdG, superoxide dismutase, IL-6, 8, TNF- $\alpha$ . bladder tissue was stained and identified muscle-to-collagen ratio.

### Results

The presence of Muscarinic receptors were no significant difference between solifenacin and KH-204 group.(M2;0.31 vs. 0.33,  $p=0.854$ , M3;0.38 vs. 0.39,  $p=0.988$ ) But there were significant differences between solifenacin and KH-204 on eNOS, RhoA, Rock-1, and Rock-2. Muscle-to-collagen ratio was statistically lower in OAB and solifenacin group but no significant difference between control and KH-204 group. Parameters for oxidative stress such as 8-OHdG, SOD was similar results. And also KH-204 group has anti-inflammatory effect which was inferred by no significant difference between control and KH-204 group in the value of IL-6, IL-8, TNF- $\alpha$ , but OAB and solifenacin group were increased in IL-6, IL-8, TNF- $\alpha$ . In the cystometrography, mean maximal pressure were different in each group, and OAB and solifenacin group were significant lower than control/ KH-204 group. And mean contraction interval was lowest in OAB, and KH-204, solifenacin, and highest in control group. And there was no significant difference between solifenacin and KH-204 group.

### Interpretation of results

The herbal extracts complex KH-204 has similar pharmacologic effect to solifenacin. And also there were anti-inflammatory effect and antioxidant effects in KH-204.

### Concluding message

Enhancement of KH-204 by Nitric oxide pathway way had effects on partial urethral obstruction induced detrusor overactivity such as benign prostatic hyperplasia related detrusor overactivity. It seemed that herbal extract formula KH-204 was another choice for control the detrusor overactivity

### References

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3. Jin LH, Andersson KE, Han JU, et al. Persistent detrusor overactivity in rats after relief of partial urethral obstruction. Am J Physiol Regul Integr Comp Physiol. 2011 Oct;301(4):R896-904

### Disclosures

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