

## BLADDER FUNCTION IN SPINAL CORD INJURY CAN BE IMPROVED BY EARLY TAMSULOSIN TREATMENT IN RAT MODEL

### Hypothesis / aims of study

Tamsulosin is a useful drug of neurogenic bladder (NB) after spinal cord injury (SCI). However it is not well known if and how this drug improve bladder function in NB. The aim of this study was to investigate the effect of tamsulosin on NB using cystometry in conscious rats. Additionally, we investigated the contractility changes of the bladder using in vitro organ bath study, as well as the expression of the associated contractile protein of the bladder using western blot.

### Study design, materials and methods

Forty eight Sprague-Dawley rats were divided into 3 groups: control (CON), SCI (SCI) and SCI with tamsulosin treatment group (SCI+TAM). Continuous filing cystometry was performed in conscious animals 3 days after the intravesical and intraabdominal catheter implantation in all group. A spinal cord transection was performed surgically at the T10 vertebral level at least 1week after cystometry in SCI and SCI+TAM group. Tamsulosin was injected intraperitoneally at doses of 0.1 mg/kg 1 day after SCI in the SCI+TAM group. Continuous filing cystometry was performed again in SCI and SCI+TAM group 1 week after SCI. Basal pressure (BP), maximal vesical pressure (MVP), threshold pressure (TP), maximal detrusor pressure (MDP), voiding interval time (VIT), Intraabdominal pressure (IAP), functional bladder capacity (FBC), residual urine (RU) were measured in each rat. After 7days, continuous filing cystometry was repeated. At the end of the experiment rats were sacrificed and bladder was removed and used for organ bath study and western blotting. One way-ANOVA and bonferroni post-hoc test were used for statistical analysis.

### Results

In conscious cystometry study, compared to the CON group, FVC, RU, VIT, MDP are significantly changed in SCI and SCI+TAM group ( $p<0.05$ ). However, there were also a significant decrease in RU and increase FBC in SCI+TAM group compared to the SCI group ( $p<0.05$ ).

In the organ bath study, acetylcholine-induced contractility in the SCI and SCI+TAM group was significantly higher than that in the CON group ( $p<0.05$ ). However, there was a significant decrease in Ach-induced contractility in SCI+TAM group compared to the SCI group. In western blotting, phsopho-ERK expression was stronger and rho-kinase expression was weaker in SCI+TAM than those in SCI.

### Interpretation of results

FVC, RU, VIT, MDP are significantly changed in SCI and SCI+TAM group ( $p<0.05$ ). There were also a significant decrease in RU and increase FBC in SCI+TAM group compared to the SCI group ( $p<0.05$ ). In the organ bath study, acetylcholine-induced contractility in the SCI and SCI+TAM group was significantly higher than that in the CON group ( $p<0.05$ ). However, there was a significant decrease in Ach-induced contractility in SCI+TAM group compared to the SCI group. In western blotting, phsopho-ERK expression was stronger and rho-kinase expression was weaker in SCI+TAM than those in SCI.

### Concluding message

These results suggest that NB after SCI can be improved by early tamsulosin treatment and it might be related with the changes of phospho-ERK and rho-kinase.

### Disclosures

**Funding:** astellas **Clinical Trial:** No **Subjects:** ANIMAL **Species:** Rat **Ethics Committee:** Institutional Guidelines of the Committee on Animal Research at Wonkwang University