urethral pressures. Needle electrodes were placed in the anal sphincter to measure compound muscle action potentials (C-MAP). UDS commenced until capacity was reached. Crede maneuver was performed, and urethral and bladder pressures were recorded. Fluoroscopy was used to insert bilateral foramen needles medial to the ischial tuberosity toward the ischial spine. During insertion, each needle was stimulated at 5 Hz and 0.2 ms until optimal pudendal nerve stimulation was confirmed with C-MAP and anal twitch. Bilateral block began with stimulation at 1 kHz and 1mA for 30 seconds. If urethral pressure during Crede was not reduced to <50 cm H2O, the stimulation was repeated at 1 kHz and 3.8mA for 30 seconds, for 1 minute, for 2 minutes, and for 4 minutes. The primary endpoint was reduction in urethral pressure <50 cmH2O. Any adverse events (AEs) were recorded.

RESULTS: A total of 3 patients completed the study. The first subject is a 56-year-old male with T9 ASIA-A SCI, and UDS showed DESD but no NDO. The urethral pressure in this first subject was reduced from 65 cm H2O to 35 cm H2O with a stimulation of 1 kHz and 3.8mA for 4 minutes. The second subject is a 46-year-old female with T9 ASIA-A SCI, and UDS showed both DESD and NDO. Because urethral pressure was difficult to measure from NDO, bladder leak point pressure was used and this was reduced from 70 cm H2O to 51 cm H2O with a stimulation of 1 kHz and 3.8mA for 4 minutes. The third subject is a 55-year-old male with T10 ASIA-A SCI, and UDS showed both DESD and NDO. The urethral pressure in this subject was reduced from 62 cm H2O to 23 cm H2O with a stimulation of 1 kHz and 3.8mA for 30 seconds. The only AE noted was mild nausea in one subject.

CONCLUSIONS: Successful reductions in urethral or bladder leak point pressures were seen in 3 SCI patients with DESD using bilateral pudendal nerve stimulation at 1 kHz. The only adverse event was mild nausea. This study supports the development of an implantable device to treat DESD by bilateral pudendal nerve block using 1 kHz stimulation.

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## PD07-08

### IMPROVEMENT OF LOWER URINARY TRACT DYSFUNCTION BY A MONOACYLGLYCEROL LIPASE INHIBITOR AFTER SPINAL CORD INJURY

*Kang Jun Cho*, Mamoru Hashimoto, Kanako Matsuoka, Sergei Karnup, Pittsburgh, PA; Joon Chul Kim, Seoul, Republic of Korea; Stephanie L. Daugherty, Jonathan M. Beckel, Naoki Yoshimura, Pittsburgh, PA*

INTRODUCTION AND OBJECTIVE: Activation of endocannabinoid system by monoacylglycerol lipase (MAGL) blockade may affect the lower urinary tract function. We investigated the effect of MAGL inhibitor, MJN110, in the mouse with neurogenic lower urinary tract dysfunction (LUTD) after spinal cord injury (SCI).

METHODS: Female C57BL/6 mice that underwent spinal cord transection at T8-10 level were divided into three groups; vehicle-treated and 5 or 10 mg/kg of MJN110 groups. MJN110 and vehicle were injected intraperitoneally for seven days from 4 weeks after spinal cord transection. We then conducted awake cystometrograms and compared urodynamic parameters between three groups. In addition, the expression of cannabinoid receptors (CB), transient receptor potential (TRP) channels and inflammatory cytokines in the L6-S1 dorsal root ganglion (DRG) or bladder mucosa were evaluated by qPCR and compared in three groups.

RESULTS: In cystometrograms, detrusor overactivity (DO) parameters, such as the number of non-voiding contractions (NVC), a ratio of time to the 1st NVC to intercontraction intervals (ICI) and NVC integrals were improved by MJN110 treatment, and some effects were dose dependent. Also, MJN110 treatment decreased bladder capacity, ICI, and residual urine volume compared to vehicle injection (Table 1), MJN110 treatment groups had lower CB2, TRPV 1, TRPA1 and inflammatory cytokines mRNA levels in DRG and the bladder mucosa.

CONCLUSIONS: MAGL inhibition can improve LUTD by attenuation of DO after SCI. MAGL can be a therapeutic target for neurogenic LUTD after SCI.

Table 1. Comparison of urodynamic parameters

| | Vehicles (n = 5) | MJN110, 5mg/kg (n = 5) | MJN110, 10mg/kg (n = 5) | P-value |
|---|---|---|---|---|
| ICI (min) | 47.3 ± 7.2 | 38.7 ± 5.8 | 21.6 ± 9.1 | 0.008* |
| NVC (/min) | 0.771 ± 0.126 | 0.605 ± 0.121 | 0.364 ± 0.250 | 0.007* |
| Micturition pressure | 61.7 ± 19.1 | 39.4 ± 3.9 | 44.2 ± 7.5 | 0.309 |
| Threshold pressure | 11.4 ± 3.5 | 10.5 ± 1.0 | 8.4 ± 4.8 | 0.301 |
| Compliance | 0.043 ± 0.011 | 0.036 ± 0.007 | 0.042 ± 0.049 | 0.151 |
| Bladder capacity | 0.474 ± 0.072 | 0.384 ± 0.059 | 0.216 ± 0.091 | 0.008* |
| Voided volume | 0.072 ± 0.042 | 0.089 ± 0.059 | 0.036 ± 0.016 | 0.151 |
| Postvoid residual | 0.401 ± 0.075 | 0.284 ± 0.059 | 0.180 ± 0.083 | 0.016* |
| Voiding efficiency | 0.147 ± 0.074 | 0.226 ± 0.146 | 0.175 ± 0.077 | 0.571 |
| Time to the 1st NVC (min) | 13.2 ± 4.6 | 19.6 ± 5.7 | 15.7 ± 8.8 | 0.690 |
| Time to the 1st NVC/ICI | 0.274 ± 0.073 | 0.506 ± 0.116 | 0.683 ± 0.162 | 0.008* |
| NVC integral ($cmH_2O$*sec) | 2058.6 ± 742.4 | 956.8 ± 361.8 | 467.4 ± 223.3 | 0.008* |

Data presented as mean ± standard deviation, * P < 0.05 compared with three groups using Kruskal-Wallis test, ICI: intercontraction interval, NVC: nonvoiding contraction, NVC integral: the area under the curve of bladder contraction for 3 minutes prior to voiding contraction

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## PD07-09

### A PROSPECTIVE PAIRED COMPARISON TRIAL ON MIRABEGRON AND ANTICHOLINERGICS IN PATIENTS WITH LOW BLADDER COMPLIANCE

*Hee Seo Son*, Jang Hwan Kim, Seoul, Republic of Korea*

INTRODUCTION AND OBJECTIVE: This study aimed to investigate the efficacy of a $\beta_3$-adrenoceptor agonist (mirabegron) on bladder compliance (BC) in patients with low BC ($\leq$ 20 ml/$cmH_2O$), even with continuous treatment with anticholinergics.

METHODS: This prospective single-arm paired comparison trial included patients enrolled in a tertiary referral center between January 2016 and October 2022. Patients with low BC of $\leq$20 ml/$cmH_2O$ in a urodynamic study performed while they were taking anticholinergics for more than one month were enrolled. After 2 weeks of the drug washout period, patients received mirabegron 50 mg/day for 8 weeks. Consecutive anticholinergics treatment (with the same regimen as that in the baseline assessment) was followed for 8 weeks. Urodynamic studies were performed at baseline, 8 weeks after mirabegron treatment and 8 weeks after anticholinergics treatment. Treatment effects were assessed by comparing urodynamic findings using paired t-tests. Data are expressed as mean and 95% confidence intervals, unless otherwise specified.

RESULTS: Fourteen patients were enrolled [male, 8; female, 6; age 54.4 (range 23.9～78.3) years]. As 3 patients refused to comply with the study after the completion of 8 weeks of mirabegron treatment, 11 patients completed the intended protocol. The duration of anticholinergics treatment at baseline assessment was 10.1 (range 2.1～72.2) months. Baseline BC was 12.01 (9.52-14.52) ml/$cmH_2O$. After 8 weeks of mirabegron treatment, BC increased significantly to 39.67 (21.60-57.73) ml/$cmH_2O$ ($p=0.007$). After returning to previously medicated anticholinergics for 8 weeks, BC decreased to 20.94 (15.78-26.10) ml/$cmH_2O$, approaching conventional significance ($p=0.075$). Among the maximum cystometric capacity and detrusor pressure at end-filling, which comprise BC, the mirabegron effect was more conspicuous in decreasing the detrusor filling pressure, showing a significant change ($p<0.001$) compared to the increase in maximum cystometric capacity ($p=0.091$) (Table 1).