

all groups. The surgical procedure was performed after 5 h of CYP administration in group II and after 24 h of the 4thCYP dose administration in group III. Saline solution was infused at a rate of 0,046 ml/min. continuously into the bladder. The measurements in each animal represent the average of 5 bladder micturition cycles, after obtaining repetitive voiding. We recorded: BP (basal pressure), PT (threshold pressure), MVP (micturition voiding pressure), ICI (intercontraction interval), Compliance, fBC (functional bladder capacity). Moreover we calculated MI (motility index) in 10-minutes intervals. In addition we analysed DI (detrusor index) in group I and DOI (detrusor overactivity index) in group II and III.

Results: After acute and chronic CYP administration we observed respectively significant decrease of MVP (21.5% in both groups), ICI (69.2% or 58.2%), fBC (69.4% or 58.3%). Also increase of BC (200% or 133%), DOI (580% or 200%), MI (76% or 38%). Compliance was significantly decreased (45.5%) only in chronic OAB. Significant changes between CMGs parameters in acute and chronic OAB were only concerned with detrusor overactivity characterized by DOI.

Conclusions: In summary, our present findings show that acute and chronic "chemical" CYP-induced cystitis lead to the overactivity of urinary bladder in rats. We have found no significant differences in basic CMGs parameters, such as BP, PT, MVP, ICI, fBC, Compliance in rats with acute or chronic OAB models. Our current results prove that both models are equally credible for cystometric evaluation.

Poster Session 4: Overactive bladder, Incontinence, Prostatitis, Miscellaneous

Friday, 11 September 2009, 14:50-17:00

Poster room 1

N47

Urodynamic effects of the bladder C-fiber afferent activity modulation in chronic overactive bladder model rats

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Introduction and Objectives: The pivotal backgrounds for overactive bladder (OAB) development are as follow: the C-fibres sensitisation (increment of sensitivity to various stimuli acting on urotelium) and local effector function of afferent C-fibres endings leading to neurogenic inflammation. Considering the polymodal features of afferent C-fibre we explored the urodynamic effect of primary afferent neurons modulation on detrusor activity in normal and overactive bladder model rats.

Material and Methods: Experiments were performed on 48 female rats. OAB was induced by cyclophosphamide (CYP) – 75 mg/kg i.p., every 3rd day for 7 days. Animals were divided into 6 groups:

- I. control,
- II. OAB,
- III. OAB + capsaicin (CAP),
- IV. OAB + lidocaine (LDK),
- V. CAP,
- VI. LDK.

Cystometry was performed under urethane anaesthesia (1h after catheter implantation, infusion rate – 0.046 ml/min.), after 24h of the 4thCYP dose in group II, after 24h of the 4thCYP and CAP in group III, after 24h of the 4thCYP within 30 min. after LDK in group IV, after 24h of the CAP in group V, after 30 min. of the LDK in group VI. 1mM CAP or 2% LDK were instilled at a

rate of 0.15 ml/min. and left contact with the mucosa for 15 and 30 minutes, respectively. The measurements in each animal represent the average of 5 bladder micturition cycles, after obtaining repetitive voiding. We recorded: BP (basal pressure), PT (threshold pressure), MVP (micturition voiding pressure), ICI (intercontraction interval), Compliance, fBC (functional bladder capacity), MI (motility index), DI (detrusor index) and DOI (detrusor overactivity index).

Results: CYP leads to decrease of MVP, ICI, fBC and compliance. Also increase of BP, DI, MI were observed. CAP produced complete inhibition of detrusor contractility. We observed a phasic detrusor contractions of low amplitude with accompanying increased intravesical pressure. As a consequence of the lack of periodically generated MVP and incomplete bladder emptying, constantly lasting urine retention occurred. In case of critical bladder fulfil achievement we recorded constant, dripping flow of urine through the urethra. Contrary, LDK leads to increase of ICI, compliance, fBC and DI. CAP and LDK reduced the severity of OAB, leading to the improvement of cystometric parameters. Compared to rats with chronic OAB we observed, increase of ICI, fBC, compliance. Also decrease of DOI and MI were observed. Surprisingly, MVP was higher after LDK, compared to control animals with chronic OAB.

Conclusions: CYP-induced cystitis leads to the OAB in rats. The modulation of C-fibres activity by CAP and LDK reduces the severity of detrusor overactivity in rats with chronic OAB, and improve its urodynamic estimation. This observations confirm the hypothesis, that in pathophysiology of overactive bladder the pivotal role play two types of unmyelinated bladder afferent C-fibres, both capsaicin-sensitive and capsaicin-resistant.

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Alterations in urinary bladder histological structure and mast cells activity following overactive bladder in rats

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Introduction and Objectives: Cyclophosphamide (CYP) damages all mucosal defence lines of urinary bladder and induces chemical cystitis leading to overactive bladder (OAB). The aim of this study was to estimate the effect of CYP on bladder wall architecture, as well as inflammatory cells and mast cells activity.

Material and Methods: Twenty four female Wistar rats were randomly divided into four equal groups: I – control, II – acute OAB, III – chronic OAB, IV – sham group. Acute and chronic OAB were induced by CYP in single dose (200 mg/kg ip.) and four doses (75 mg/kg ip. every 3rd day for 7 days of experiment), respectively. All animals were sacrificed by pentobarbital overdose. After bladder removal, thin sections were cut and stained with hematoxylin and eosin for histological assessment and with toluidine blue for mast cells evaluation. In each fragment 10 consecutive cross sections were examined. The severity of inflammation was examined according to 4 criteria (mucosal abrasion, hemorrhage, leukocyte infiltration and oedema). In addition, the total number of mast cells was counted at 200× magnification.

Results: The CYP-treated rats exhibited macroscopical signs of urinary bladder inflammation, i.e. redness, oedema (in group II, III) and also wall thickening, mucosal erosions, ulcerations, petechial hemorrhages on the serosal surface (in group III). In some animals of the group III the urine contained blood. Rats in the groups I and IV had healthy bladders and normal urine. Microscopic evaluations of acute and chronic