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GABAPENTIN SUPPRESSED VOIDING FUNCTION AND VISCERAL PAIN-RELATED VISCEROMOTOR REFLEX IN MICE WITH CYCLOPHOSPHAMIDE-INDUCED CYSTITIS

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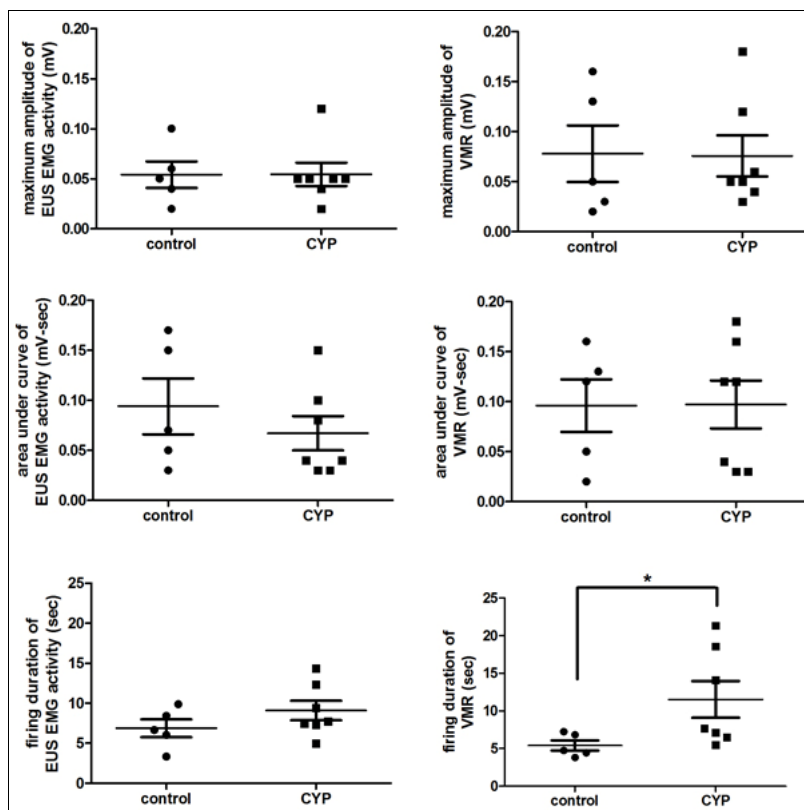
## **GABAPENTIN SUPPRESSED VOIDING FUNCTION AND VISCERAL PAIN-RELATED VISCEROMOTOR REFLEX IN MICE WITH CYCLOPHOSPHAMIDE-INDUCED CYSTITIS**

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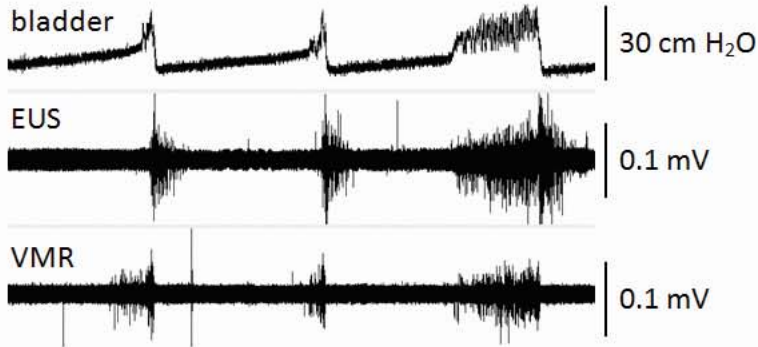
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### *Abstract:*

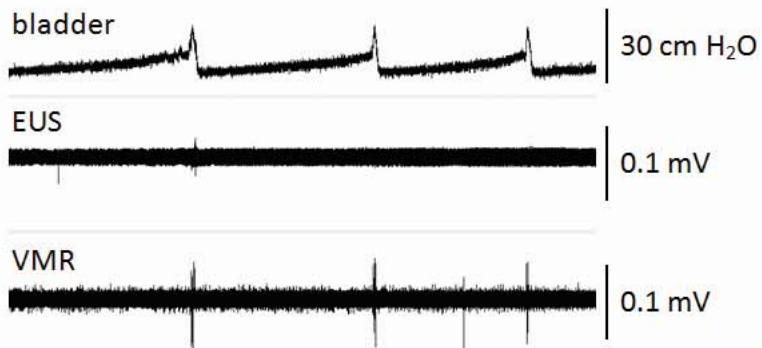
**Introduction:** Interstitial cystitis/painful bladder syndrome (IC/PBS) is a debilitating condition of unknown etiology characterized by pain associated with bladder that affects 3-8 millions in the United States. It is a global disease with varying prevalence because of different diagnostic criteria. It is difficult to characterize the pain with existing diagnostic tools, such as visual analog scales. A novel prototype method integrating urodynamics, pain sensing, and electromyography (EMG) of abdominal muscles, and diagnosing functionalities at the end of the study can offer physicians a useful tool to examine the visceral pain. The visceromotor reflex (VMR) is an EMG recording of the external oblique muscle in response to the level of visceral pain induced by inflammatory bladder and graded bladder distention (non-inflammatory). **Objective:** A quantitative evaluation of visceral pain-related VMR in IC/PBS, would be ideal to refine its diagnosis and guide treatment. In this study, voiding function and VMR were examined in naive mice, and the mice with acute cyclophosphamide (CYP)-induced cystitis. Furthermore, pharmacological administration of gabapentin was also investigated for possible treatment since gabapentin has been clinically using for neuropathic pain. **Methods:** A total of 12 BDF1 mice were used. 5 mice were given 0.1 mL of saline (ip), and another 7 mice received 200 mg/kg of CYP (ip) 48 hours before the urodynamic recordings. At the day of urodynamic recording session, the animals were anesthetized by urethane (1.5 g/kg, ip). A PE-50 tube was inserted into the bladder dome. Then the tube was connected to the infusion pump (1.8 mL/hr) and the pressure sensor to obtain the bladder pressure. Left external oblique muscle was exposed and embedded with wires to obtain the VMR during voiding. Two wires were inserted with 27-gauge needle from the urethral outlet, and embedded inside the urethral sphincter to obtain EUS EMG activity. Gabapentin (50 mg/kg, ip) was given to examine the voiding function and VMR at the end of recording sessions. **Results:** In the mice with acute CYP-induced cystitis, the bladders were larger, and bloody urine was found during the surgical preparation. Firing durations of VMR were significantly increased in the mice with cystitis (Figure 1). The effect of gabapentin started to affect the voiding contractions 0.5-4 hours after drug administration (Figure 2). Gabapentin gradually suppressed the EUS EMG activity and VMR, and then completely eliminated the micturition reflexes and VMR in 1 hour. **Conclusions:** Gabapentin did not significantly prolong the inter-contraction intervals, which means no effect on the overactive bladder induced by cystitis. Decreased EUS EMG activity and VMR indicated that gabapentin may ameliorate visceral pain induced by CYP as well as partially suppress the voiding function. The study showed that BDF1 female mouse is suitable for investigating altered voiding function and visceral pain associated with CYP-induced cystitis. Further studies are needed to establish a dose-response curve of gabapentin on the urodynamic recordings and VMR. **References:** None



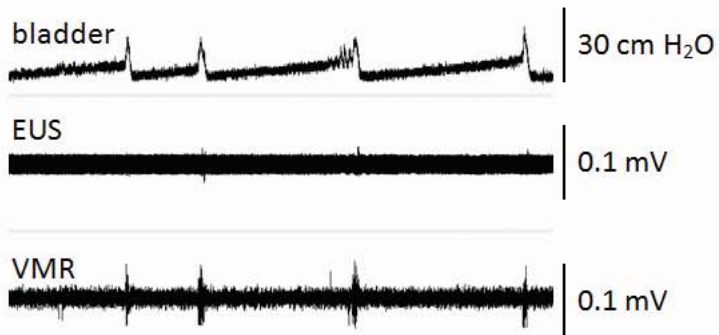
### A. without drug



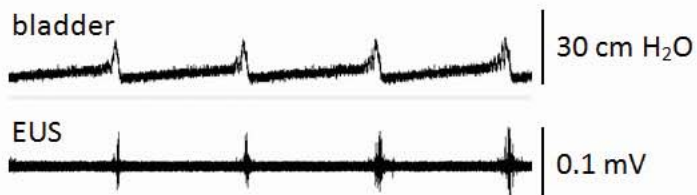
### B. 30 mins after drug

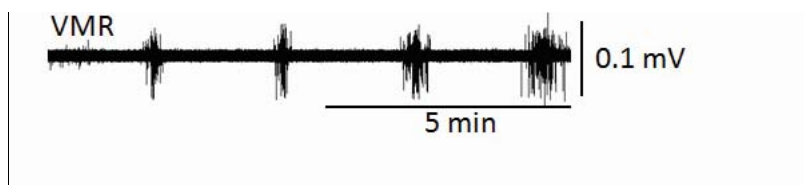


### C. 2 hours after drug



### D. 4 hours after drug





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Category (Complete): Basic Science

Keyword (Complete): Painful Bladder Syndrome/Interstitial Cystitis ; sphincteric function

Additional Questions (Complete):

\*Was study presented/published previously?: No

\*This study was NOT previously presented at an **International Meeting**: Confirmed

\*Was work supported by industry? : No

\*Level of support : Investigator initiated, partial funding

\*Was consent obtained from patients?: No

All authors have reviewed the abstract as submitted and have confirmed approval: Confirm

\*Is the presenter a Fellow?: No

Does this study have IRB or Ethical Committee Approval?: Yes

IRB Identifier Number or IACUC number for Animal Studies (enter N/A for not applicable) : 2012-3047

Status: Complete

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