The effect of beta-3 adrenergic receptor agonist on micromotions of major pelvic ganglion disconnected rat bladder

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**Background**

- **What is Micromotion**
  - Micromotion is intrinsic localized motility of bladder wall, comprising microcontractions and microelongations.
- **How is Micromotion generated**
  - Micromotion is regarded to be associated with intravesical pressure fluctuations in case of altered neural modulation.
- **Why is micromotion important**
  - Local distortion of bladder wall made by autonomous micromotions may generate afferent nerve activity resulting in increased filling sensation, urgency, or pelvic pain.
- **Can we detect micromotion with CMG**
  - Micromotion may be related to suppression of bladder afferent activity.
- **How is micromotion controlled**
  - Micromotion is controlled by the descending inhibitory influences that are lost resulting in disinhibited autonomy expressed when normal coordination of microcontractions are decreased.

**Methods**

- **Animals**
  - Male Sprague-Dawley rats (N=18)
- **Disconnection of major pelvic ganglion**
  - Rats were anesthetized with 2% isoflurane in oxygen. MPGs were identified in the lateral aspect of the prostate and were carefully removed under microscope.
- **Experiments were performed after 1 week of adaptation period following MPG disconnection**
- **Grouping of subject animals**
  1. β3 adrenergic receptor agonist (CL-316243) group
  2. β3 adrenergic receptor antagonist (SR59230A) pretreated CL-316243 group
  3. Non-selective muscarinic receptor antagonist (Oxybutynin) group
- **Cystometrogram**
  - PE-50 tubing was introduced into the bladder and cystometrogram was performed by infusing physiological saline at a rate of 0.12ml/min
- **Assessment**
  - Frequency of micromotion was checked at baseline, after administration of vehicle (saline) (i.a.), after administration of each target agent (i.a.) consecutively

**Results**

- **Micromotion frequency was significantly decreased after injection of CL-316243 (2.2±3.5/10min) compared to baseline (7.5±2.8/10min) (P=0.005)**
- **There was no significant change of micromotion frequency in SR59230A pretreated CL-316243 group (6.3±1.9/10min) compared to baseline (6.3±1.5/10min) (P=1.000)**
- **The number of micromotion after Oxybutynin injection (3.2±3.1/10min) was not significantly different from that of baseline (5.7±3.1/10min) (P=0.059)**

**Conclusions**

- **We could observe that systemically administrated beta-3 adrenergic receptor agonist have effect in alleviating micromotions of MPG disconnected rat bladder**
- **These results also suggest that beta-3 adrenergic receptor agonist might be an effective agent in controlling the initiation of overactive bladder**

**References**

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3. BJU International. 2001;88:1053-7