



Spinal cord injury-induced detrusor overactivity

A MODEL FOR NEUROGENIC OVERACTIVE BLADDER

Model

Cystometry in conscious animals following transection of the spinal cord.

In rodents, spinal cord injury (SCI) induces an initial areflexic bladder which is followed by the emergence of spinal reflex mechanisms that mediate micturition.

Two types of cystometric profiles are observed in SCI rats in accordance with literature. SCI rat with non voiding contractions (NVC), occurring before the voiding contraction, and SCI rats with high amplitude of micturition pressure and without NVC (see typical traces)

Species

- Rat
- Mouse

Interest

- This model is suitable for testing compounds acting on C-fiber afferents and non-voiding contractions.
- Compounds that produce positive effects in this model include β_3 adrenoceptor, glutamate receptor antagonists, COX inhibitors, prostacyclin receptor antagonists and P2X3 receptor antagonists.

Model Description

- A laminectomy is performed at T8 level and the spinal cord is sectioned.
- Four-five weeks after SCI, cystomanometry is performed in conscious rats via continuous intravesical infusion of saline.
- Test compounds can be administered via various routes (i.v., i.p., p.o., i.g. s.c.) and cystometric parameters evaluated up to two hours in conscious animals.

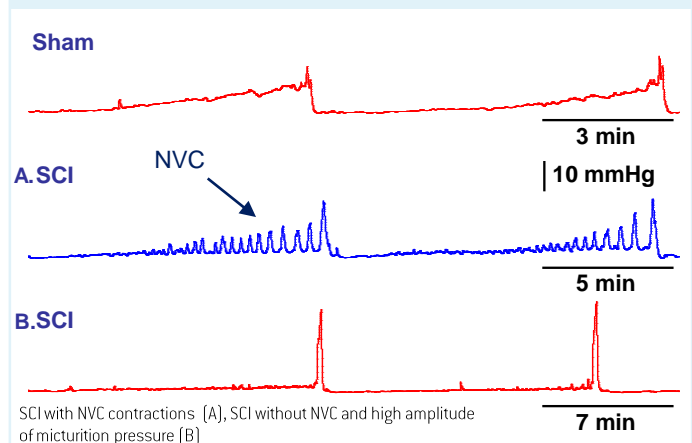
Parameters evaluated

- Bladder capacity
- Micturition volume
- Amplitude of micturition
- Amplitude and frequency of non-voiding contractions
- Basal intravesical pressure
- Threshold pressure for micturition

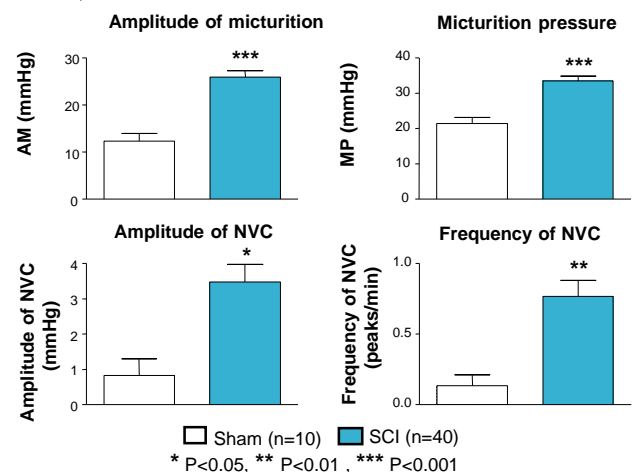
Scientific publications

- Beauval *et al.*, *NeuroUrol. Urodyn.*, 2014
- Seki S *et al.*, *J. Urol.* 171: 478-482, 2004
- Yoshiyama M *et al.*, *Expr. Neurol.* 159: 250-57, 1999
- Khera M *et al.*, *BJU Int.* 99: 442-46, 2007
- Lu S.H *et al.*, *J. Chin. Med. Assoc.* 70: 439-44, 2007

Cystometric profiles in conscious female rats: comparison of sham-operated and SCI rats



SCI with NVC contractions (A), SCI without NVC and high amplitude of micturition pressure (B)



Effect of β_3 receptor agonist, CL-316,243 [0.1 mg/kg] on cystometric parameters in conscious SCI rats

