



Bladder outlet obstruction (BOO)

A MODEL FOR OVERACTIVE BLADDER (OAB)

Model

Overactive bladder (OAB) is defined as a clinical syndrome characterized by the presence of urgency in the absence of inflammation. Clinical observations suggest a cause-effect relationship between bladder outlet obstruction (BOO) and OAB. In this model, OAB is induced by partial bladder obstruction. This model is associated with urinary bladder structural and functional changes.

This model mimics HBP symptoms characterized by urethral obstruction associated with bladder dysfunction.

Species

- Rat
- Mouse
- Guinea-pig

Interest

- As observed in clinic, this model is characterized by structural changes of the urinary bladder (muscular hypertrophy, absence of inflammation...) as well as detrusor instability / non-voiding contractions (NVC).
- Compounds that show a positive response include antimuscarinics and K_{ATP} channel openers.
- This model is reliable and widely used to test therapeutic approaches for OAB / detrusor instability.

Model Description

- Urinary bladder is partially obstructed by tying a ligature around the urethra for 6 weeks.
- Cystomanometry is performed in conscious animal using saline infusion into the bladder.
- Tested compounds can be administered *via* various routes (i.v., i.p., s.c., p.o., intravesical).

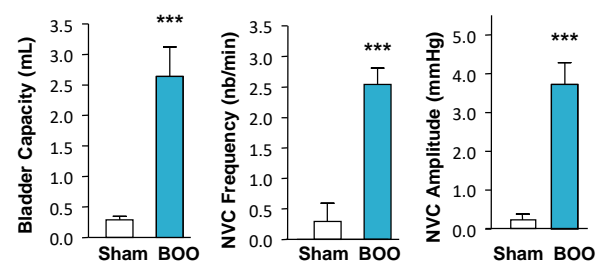
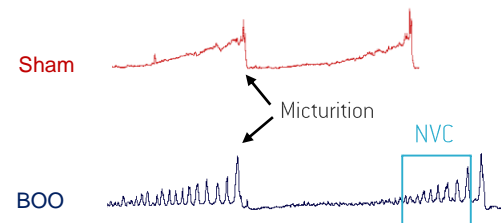
Parameters evaluated

- Bladder weight and bladder capacity.
- Intercontraction intervals (ICI).
- Micturition volume, pressure and duration.
- Non-voiding contraction (NVC) amplitude and frequency.
- Histological analysis on bladder sections: Hematoxylin–Eosin (HE), Red Sirius... staining associated with slide scanning technology. Quantification is performed using ImageJ® software.

Scientific publications

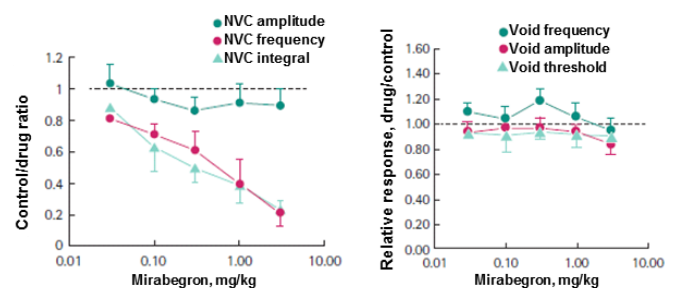
- Gillespie J *et al*, BJU. Int. 110: E132-142, 2012
- Lluel P *et al*, NeuroUrol. Urodyn. 21: 142-153, 2002
- Lluel P *et al*, J. Urol. 160: 2253-2257, 1998

BOO induces voiding dysfunctions

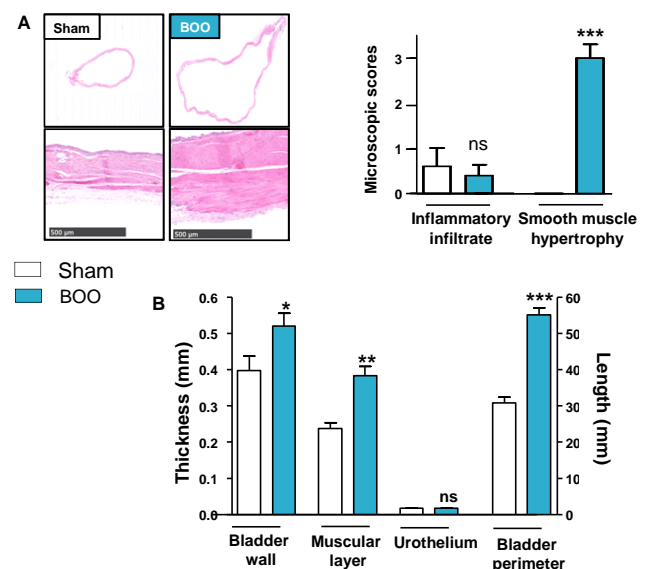


** $P < 0.01$, *** $P < 0.001$, $n = 8-9$ /group

Effect of mirabegron on cystometric parameters in BOO rats



BOO induces urinary bladder structural changes



Urinary bladder HE staining [whole urinary bladder (top) and higher magnification (bottom)] and corresponding analysis (A) in conscious female rats and corresponding analysis (B).
 $ns > 0.05$, * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$ ($n = 5$ /group)