Abstract # 78

Age mediated effects of oxytocin antagonists on tension in the rat bladder: An organ bath evaluation

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Introduction

- Overactive bladder (OAB) is a condition characterized by changes in the urinary behaviour such as frequency, urgency, nocturia and urge incontinence[1].
- With aging, these conditions frequently deteriorate resulting in adverse changes to an individual's quality of life[2].
- Recent evidence suggests that oxytocin signalling, which is involved in cellular proliferation, cellular differentiation and smooth muscle contractility, might have an association with this disorder.

Aim

- To examine the effects of the oxytocin & oxytocin receptor antagonists (atosiban, cligosiban & ßMßßC) on the smooth muscle contractions within the bladder.

Methods

- Contractility studies were conducted on bladder tissue from young (7-9 weeks) and older (4-9 months) Sprague - Dawley male rats (n=5, each group) via tension gauge organ bath.
- Cumulative dose response curves to oxytocin (OT) (^11-^6M) generated pre- and post- incubation with oxytocin receptor antagonists i.e. atosiban (AT) (^6M & ^5M), cligosiban (CLIGO) (^6M & ^5M), and ß-mercapto-ß,ßcyclopentamethylenepropionyl (ßMßßC) (^6M).
- Data measured are mean ± SD, with statistical analysis done by 2-way ANOVA with Tukey multiple comparisons test, using GraphPad Prism software (version 9; GraphPad Software, La Jolla, CA, USA).
- p value < 0.05 was considered significant.
- Ethical approval was obtained by the ethics committee, Monash Animal Research Platform, Clayton, Australia (Ref No. 00000).

References

1. Romine, M.T. and G.F. Anderson, *Evidence for oxytocin receptors in the urinary bladder of the rabbit.* Canadian Journal of Physiology and Pharmacology, 1985. **63**(4): p. 287-291.
2. Pandita, R., A. Nylen, and K.-E. Andersson, *Oxytocin-induced stimulation and inhibition of bladder activity in normal, conscious rats—influence of nitric oxide synthase inhibition.* Neuroscience, 1998. **85**(4): p. 1113-1119.

Results

Figure 1. Young and aged rats bladder showed significant sensitivity to oxytocin that is substantially attenuated by ßMßßC (^6M) **(p<0.0001**)

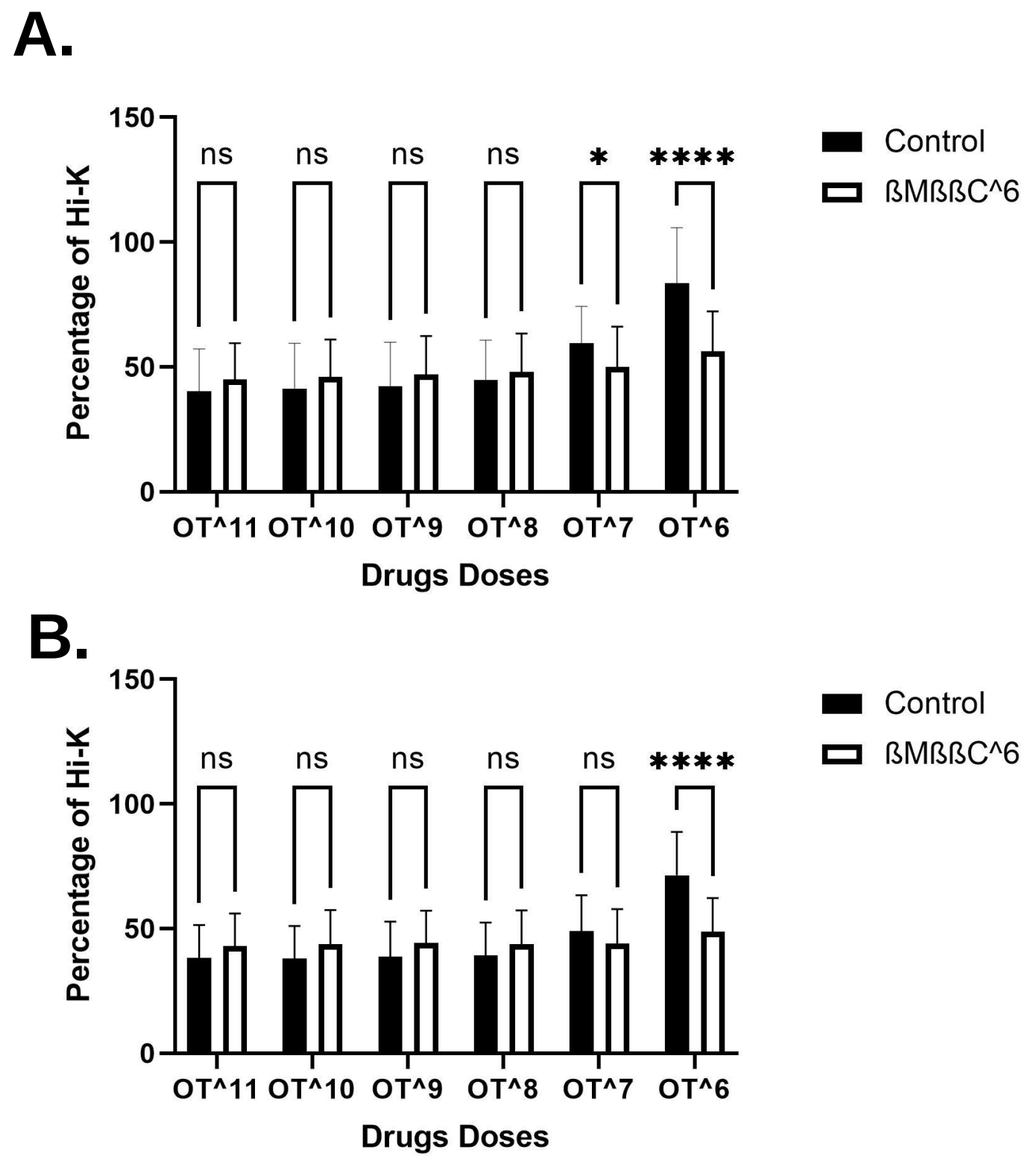


Figure 2. Lower concentration of atosiban (^6M) were capable of significant inhibition of oxytocin induced bladder contractions within young but not older rats **(p<0.05**)

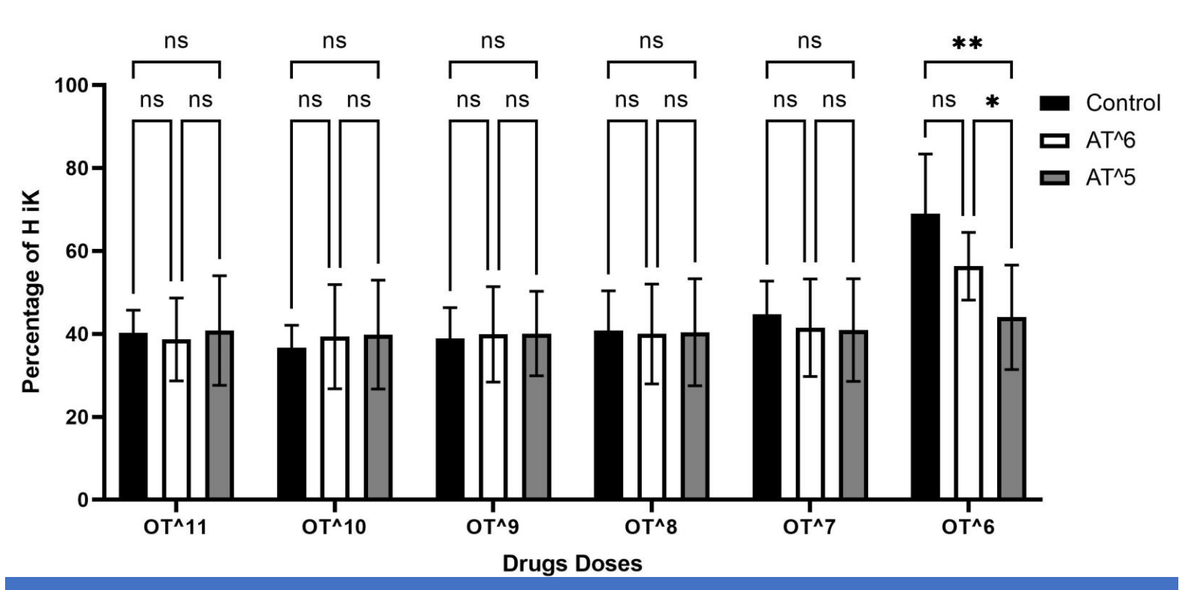
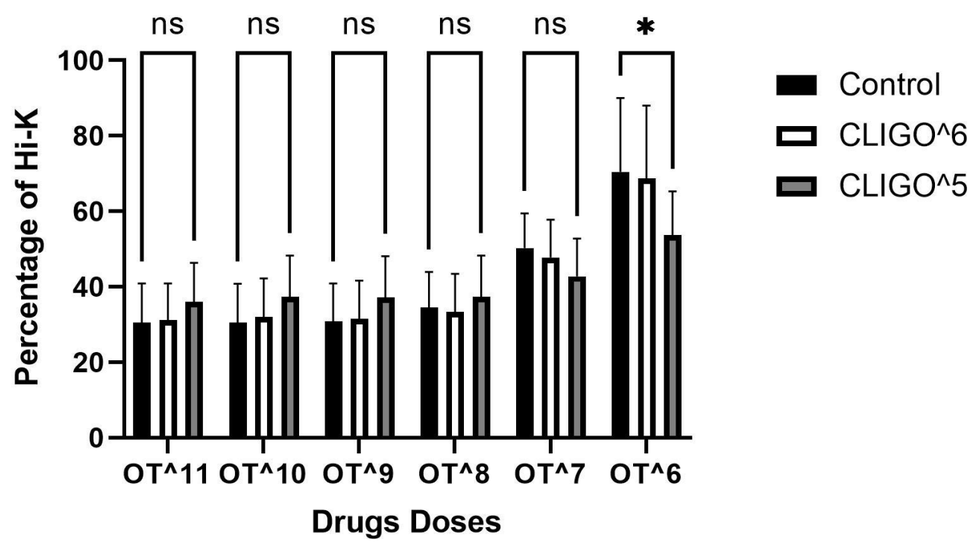


Figure 3. Higher concentration of cligosiban (^5M) achieved marked inhibition of oxytocin induced bladder contractions within older rats **(p<0.05)**



Conclusions

- This study indicates that oxytocin can induce contractility in bladder smooth muscle from young and older rats.
- Oxytocin receptor antagonists such as ßMßßC, atosiban and cligosiban are capable of inhibiting OT induced contractions, there appears to be greater sensitivity to ßMßßC across ages.