

COMPARATIVE STUDIES OF MUSCARINIC-MEDIATED CONTRACTILE RESPONSES OF DETRUSOR SMOOTH MUSCLE FROM CONTROL AND NEUROGENIC BLADDER DYSFUNCTION PATIENTS.

Hypothesis / aims of study

In the present study we have examined the contractile responses of isolated detrusor smooth muscle to muscarinic agonists in neurogenic bladder dysfunction and control patients.

Study design, materials and methods

Bladder muscle specimens (3 x 2 cm) were obtained from eight neurogenic bladder dysfunction patients that underwent reconstructive surgery of lower urinary tract. The control group was composed by eight cadaver multiples organ donor without previous history of miccional dysfunction. A strip of bladder (3x2 cm) was obtained during the organs' harvest. The protocol was approved by the University Hospital Ethics and Research Committee. Detrusor smooth muscle strips were placed in chilled Krebs solution and mounted in 10-ml organ chambers. Isometric force was recorded using a PowerLabTM data acquisition system. Concentration response curve to both the full muscarinic agonist carbachol (CCh, nM–10 µM) and the partial agonist pilocarpine (PIL, 1 nM–100 µM) were obtained. Values of pEC₅₀ and maximal responses (E_{max}) were calculated.

Results

The potency (pEC₅₀) of CCh and PIL in detrusor smooth muscle (DSM) strips of control group (6.46±0.03 and 5.71±0.17; N=8) did not differ significantly from neurogenic detrusor overactive patients (6.39±0.06 and 5.69±0.12, respectively; N=7-8). Similarly, the E_{max} values for CCh and PIL in control (0.45±0.07 and 0.30±0.11, respectively) and detrusor overactive patients (0.38±0.15 and 0.34±0.24, respectively) did not differ between both groups. There were no differences in the DSM contractile responses to KCl and electrical-field stimulation (EFS, 0.5-32 Hz, 10 second) between both groups (Fig. 1).

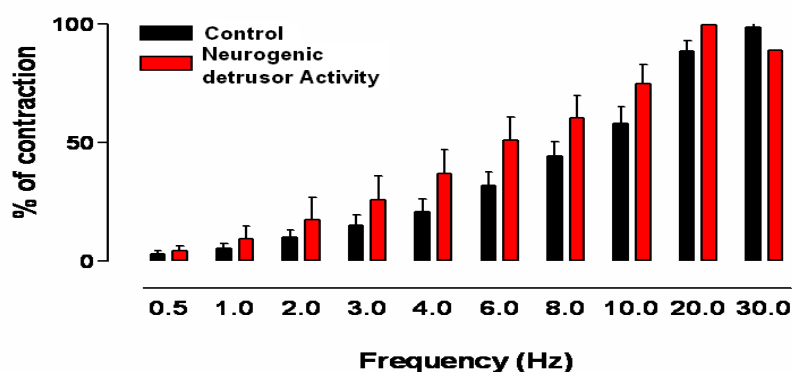


Figure 1 - Contractile responses to electrical-field stimulation (EFS, 0.5-32 Hz, 10 second) between the groups.

Interpretation of results

The contractile responses to carbachol and pilocarpine (pEC₅₀ and E_{max}) did not differ from control individuals and neurogenic bladder dysfunction patients. Therefore, the fail of anticholinergics medications observed in some patients with neurogenic bladder dysfunction (detrusor overactivity and low compliance) is due to ultra structural changes in the detrusor (collagen deposit).

Concluding message

The muscarinic receptor populations in detrusor smooth muscle are similar in both groups.

<i>Specify source of funding or grant</i>	none
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Ethica Committee of Universidade Estadual de Campinas
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes