

UROTHELIUM-RELATED INHIBITION OF DETRUSOR ACTIVITY IS ABOLISHED BY BLADDER OUTLET OBSTRUCTION IN RABBITS

Hypothesis / aims of study

Urothelium has been found to contain an inhibitory function on detrusor activity. Whether this inhibitory function is altered following outlet obstruction remains unknown.

Study design, materials and methods

Bladder outlet obstruction was induced in 8 male New Zealand rabbits by placing a silicon ring around the bladder neck. The bladders were removed 14 days later. Seven sham operated animals served as the controls. Spontaneous activity of tissue strips obtained from bladder body before any pharmacological manipulation and its responses to various agents were investigated. Contractile and relaxation responses of the strips were assessed by field stimulation and pharmacological agents. All experiments were done on bladder strips with and without mucosa.

Results

Outlet obstruction significantly increased bladder weight (1.3 vs 6.2gm). In control group, the frequency of spontaneous contraction was significantly increased from 7.8 to 12.8 contractions per minute following removing mucosa. In contrast, in obstruction group the frequency of spontaneous contraction was not altered by mucosa removal. Otherwise, in both group, either with or without mucosa, the frequency of spontaneous contraction was not affected by atropine, propranolol, hexamethonium or L-NAME.

In control group, the response to 500 μ M bethanechol, but not field stimulation, was significantly increased from 187% to 249% of KCl response following removing mucosa. However, in obstruction group the contractile response to bethanechol was not different between mucosa-intact and mucosa-free group.

Interpretation of results

Urothelium-related inhibition of detrusor activity is abolished by bladder outlet obstruction in rabbits.

Concluding message

In rabbits, urothelium has an inhibitory function on detrusor activity, which is not observed following bladder outlet obstruction. Alterations in urothelial function may have a significant contribution to motor and sensory impairment of the urinary bladder induced by outlet obstruction.