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NEUROMETER MEASUREMENT OF CURRENT PERCEPTION THRESHOLD (CPT) IN RATS BLADDER

Hypothesis / aims of study

To find a practical way to measure the bladder mucosal sensory threshold by nerve-specific electric stimulation.

Study design, materials and methods

Intravesical nerve stimuli of the three sine-wave pulses produced by the Neurometer at 2000, 250 and 5 Hz which stimulate large myelinated (A β -), (A δ -) and small unmyelinated (C-) nerve fibers were applied through catheter to both normal 14-week control and diabetic rat's bladder mucosa under anaesthesia conditions (Urothane 1.2g/kg). Stimulation lasted for 1 minute duration. The blood pressure and heart rate were monitored through carotid artery intubation with data acquisition system. The intensity of each stimulation at which rat's blood pressure or heart rate changed was defined as the current stimulus threshold (CPT).

Results

With repeated stimulation, the CPT values were almost constant. Significant heart rate changes were detected in control rats whereas blood pressures were almost stable. The heart rate rose and maintained at a high level during the one minute stimulation period. The CPT threshold values were 10, 30 and 80 (100=1.0mA) corresponding to 5, 250 and 2000 Hz stimulation. Whereas in diabetic rats, the changes occurred on blood pressure other than heart rate. The blood pressure rose significantly in a very short period of time and then restored to baseline during the one minute stimulation period. The CPT threshold values were 10, 30 and 120 corresponding to 5, 250 and 2000 Hz stimulation.

Interpretation of results

Quantitative neuroselective measurement of CPT values in animal bladder mucosal function was feasible.

Concluding message

Hypersensitivity and hyposensitivity of the animal urinary sensory function could be determined in this established method of measurement.

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