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HOW TO INDUCE RELIABLE PENILE ERECTIONS IN A SMALL ANIMAL MODEL? – ELECTROSTIMULATION OF THE NEUROVASCULAR BUNDLE

Hypothesis / aims of study

Induction of penile erections by means of neurostimulation of the nervi erigentes in the periprostatic neurovascular bundle (PNB) has been a difficult challenge to be reproducible in a small-animal model so far.

Study design, materials and methods

Six male rabbits were anesthetized i.v. with ketamine hydrochloride (50 mg/kg/h) and xylazine hydrochloride (6 mg/kg/h). After median laparotomy the PNB including the nervi erigentes were exposed. Unilateral and bilateral neurostimulation of the PNB followed (impulse duration 500 μ s, amplitude 0.4 mA, frequency 15 Hz). The ensuing penile erections were compared. Analogous procedures were performed in 3 rabbits, all of which received the anesthetic alpha-chloralose i.v. (70 mg/kg/h).

Results

It was possible to induce reproducible penile erections both under uni- and bilateral neurostimulation. Bilateral stimulation led to stronger erections with an increase in length in comparison to unilateral stimulation. Stimulation-induced penile erections reached their maximal intensity after approx. 20 sec. When the impulse was switched off, we observed speedy detumescence of the penis. In the animals anesthetized with alpha-chloralose there was no evident difference in the erection intensity.

Interpretation of results

This rabbit model is a reliable small-animal model in which it has been possible to induce reproducible penile erections through neurostimulation of the Nn. erigentes in the PNB. No difference between the applied type of anesthetic has become evident.

Concluding message

This model offers all the advantages of a small-animal model and, thanks to the good exposability of the Nn. erigentes, appears to be particularly well-suited for further experimental research, e. g. in the field of erectile dysfunction (ED) and possibly postoperative incontinence after pelvic surgery in men. It may help to lay the basis for new developments to improve intraoperative diagnostics in interventions endangering male potency and continence, as well as with respect to new postoperative therapy forms for ED and continence on the basis of neurostimulation.

Disclosures

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