149

Bannowsky A[1], Sugimoto S[1], Boehler G[1], Klein B[1], Kalz A[1], Seif C[1], Egberts J[1], Wefer B[1], Juenemann K P[1], Braun P M[1]
1. Dept. of Urology, Universityhospital Kiel

?-CHLORALOSE – A RELIABLE ANIMAL MODEL TO INDUCE BLADDER INSTABILITIES IN A RABBIT

Aims of Study
The induction of reproducible bladder instabilities in animal models continues to be a problem in many current neurourological studies; this applies in particular to research in neuromodulation. A crucial parameter for successful induction of instabilities seems to be the type of anesthesia. At present there are no animal models demonstrating how reliable involuntary bladder contractions can be induced, which is an indispensable basis for many questions of experimental research in the fields of neuromodulation and neurostimulation. The aim of the present study was to trigger regular, persistent and reproducible detrusor instabilities.

Methods
We performed intravenous anesthesia with a-Chloralose (70 mg/kg per hour) in 6 intubated and artificially respired rabbits. After insertion of a transurethral catheter, 10 ml of 0.25%, 0.5%, 1% and 5% formalin solution were successively instilled into the urinary bladder. The intravesical pressure was continuously recorded by means of a urodynamics unit. Analogous procedures were performed in 6 other rabbits which were anesthetized by continuous intravenous perfusion of ketamine hydrochloride (50 mg/kg per hour) and xylazine hydrochloride (6 mg/kg per hour).

Results
Under anesthesia with ketamine hydrochloride and xylazine hydrochloride it was impossible to trigger detrusor instabilities with intravesical pressure amplitudes of over 8 cmH_2O. Under a-Chloralose by contrast, we were able to induce involuntary bladder contractions with amplitudes of up to 45 cmH_2O after intravesical instillation of 0.25% formalin solution. The maximum amplitude was reached after 15-20 min. The bladder contractions continued over a period of 2-5 hours after instillation. Increased concentration of formalin led to an earlier occurrence of instabilities with higher intravesical pressure amplitudes. These instabilities, however, also subsided much more quickly. After intravenous application of ketamine hydrochloride (2 mg/kg) and xylazine hydrochloride (0.2 mg/kg) the contractions ceased immediately. A reoccurrence of the instabilities could be observed in relation to the dose of intravenous ketamine hydrochloride/xylazine hydrochloride. Renewed application of ketamine hydrochloride (10 mg/kg) and xylazine hydrochloride (1 mg/kg) led to total disappearance of detrusor instabilities without reoccurrence over 2-3 hours.

Conclusions
The rabbit model with a-Chloralose shows reliable and reproducible induction of bladder instabilities even with low formalin concentration. Although higher concentrations of formalin lead to prompter and more intense contractions, their duration is too short to make use of them in most experiments, e. g. neuromodulation research. The difference between a-Chloralose and the ketamine hydrochloride/xylazine hydrochloride anesthesia is significant and shows the inefficacy of the latter for experimental purposes as even small doses suppress bladder instabilities over long periods of time.
Usage of a-Chloralose combined with intravesical formalin instillation has proved a reliable animal model for the induction of reliable and persistent bladder instabilities to be used in future experimental research in neuromodulation and neurostimulation.