745

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EFFECT OF ANESTHETICS ON URODYNAMIC STUDY IN NORMAL RATS

Hypothesis / aims of study

Anaesthetics are used to perform urodynamics in animals (1). However, some of them can abolish the micturation reflex (2). The objective of this study was to compare the effects of ketamine, ether, propofol and midazolam on filling and voiding in female rats.

Study design, materials and methods

The University Ethics Committee granted ethical approval for the study. 30 adult wistar rats were used in this study. Anaesthesia was induced with ether inhalation. The abdomen was opened through a midline incision, and 4-chromic catgut suture was passed around the bladder dome. A small incision was then made within the sture limits, and 6 Fr double lumen cystometric catheter was passed into the bladder. Bladders were filled with saline (6ml/h), while resting bladder pressure (RBP), a period between micturation (PM), micturition pressure (MP) and voiding volume (VV) were measured. The list of administered drugs was as follows: ether inhalation (6 rats), midazolam (6 rats-2.5-25mg/kg), propofol (7rats-8-20mg/kg) and ketamine (11rats-5-15mg/kg). All drugs were administered intraperitoneally beside ether inhalation, followed by normal urodynamic study for each groups. Wilcoxon signed-rank test was used when appropriate for statistical data analysis. For all statistical tests, $P<0.05$ was considered significant.

Results

Ketamine was found to be very depressant to micturation. Six of 11 had no micturation following ketamine administration, and micturation reflex was inhibited by ketamine in dose-dependent fashion in the rest of them. Parameters were so similar in ether and midazolam groups compared to normal rats, while propofol administration changed RBP, MP and PM. However, parameters were not significantly changed by midazolam, ether, propofol. All parameters were summarised in table 1

Parameters	Normal **(Mean±SD)**	Midazolam **(Mean±SD)**	Normal **(Mean±SD)**	Propofol **(Mean±SD)**	Normal **(Mean±SD)**	Ketamine **(Mean±SD)**	Normal **(Mean±SD)**	Ether **(Mean±SD)**
RBP(cmH2O)	12±4.1	11.5±3.9	9.2±3.8	13±7.7	6.3±3	7.7±3.2	7±2.1	6±2
MP(cmH2O)	23.8±2.9	24.8±2.3	19.7±6.7	23.5±12.4	23.5±11.6	24.5±9.1	20±9.5	22±10.6
PM(sc)	41.5±21.8	46.5±32.9	47.8±18.7	61.7±35	32.8±11.9	42±24.6	33±6.2	35.5±7
VV(ml)	0.6*	0.5*	0.5*	06*	0.7*	leakage	0.6*	0.7*

* No SD was given related to unreliable results of VV related to technique

Interpretation of results

Ketamine inhibits, in a dose-dependent manner, micturation reflex. This effect likely related to N-methyl-D-aspartate (NMDA) receptor antagonist actions of ketamine.

Concluding message

Our findings indicated that ether and midazolam were suitable for preserving micturation and permitting urodynamic testing in rats. On the other hand, Ketamine abolished micturation reflex and it was not appropriate for anaesthesia in rats for urodynamic testing.

References

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2.Effect of anesthetics on reflex micturation in the chronic cannula-implanted rat. Neurourology and Urodynamics 87-99,2000.