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Short communication

Reversal of Ketamine-Xylazine anaesthesia with 4-Aminopyridine in rats

Ketamine, a cateleptoid anaesthetic is commonly used along with other depressants to induce anaesthesia in various species of animals. In the present study in rats 4-Aminopyridine (4-AP) was used to reverse Ketamine-xylazine anaesthesia.

One hundred and thirty two rats divided into six groups were used. First, second and third groups (C1, T1 & T2) received 20 mg/kg Ketamine and 10 mg/kg Xylazine i.m. as a combined injection. C1 served as control, T1 & T2 served as treatments which received 4-AP (2.5 mg/kg i.m.) 10 and 15 min. after induction of anaesthesia. Fourth, fifth and sixth groups (C2, T3 & T4) received 10 mg/kg Ketamine and 20 mg/kg Xylazine i.m. as a combined injection, C2 served as controls and T3 & T4 served as treatments which received 4-AP (2.5 mg/kg i.m.) 10 and 15 min after induction of anaesthesia. At higher doses of 4-AP (3 mg/kg) animals showed muscular tremor. The time of induction, duration and recovery were recorded. The data were analysed by 't' test.

The first control group (C1) showed a duration and recovery period of 37.6 ± 13.8 and 48.0 ± 15.7 min respectively. In the T1 & T2 group 4-AP showed a significant reduction in the duration and recovery period (Table 1). Thus it is evident that 4-AP has successfully acted as a reversal agent.

Schmidt (1983) and Kitzman *et al.* (1984) got the same observation when they used 4-AP along with yohimbine to reverse the anaesthesia in elephants and geldings respectively. The present observation is in agreement with the observation of Komulainen and Olson (1991) who used 4-AP alone to reverse the Ketamine-Xylazine anaesthesia.

The duration of anaesthesia and recovery period of the 4th group (C2),

Table 1 The duration and recovery period of anaesthesia in different groups of animals

	Ketamine 20 mg/kg and xylazine 10 mg/kg i.m. Mean + SEM			Ketamine 10 mg/kg and xylazine 20 mg/kg i.m. Mean + SEM		
Group	I	II	III	IV	V	VI
	C1	T1	T2	C2	T3	T4
Duration of anaesthesia	37.6 ± 13.8	24.6 ± 3.8	28.1 ± 3.6	49.8 ± 7.2	28.1 ± 5.2	23.1 ± 4.1
Recovery	48.0 ± 15.7	31.7 ± 5.1	37.1 ∓ 5.8	55.3 ± 7.4	34.8 ± 5.8	29.3 ± 5.0

which received the second dose regimen was significantly higher than the corresponding values of the first group (C1 Table 1) indicating that higher dose levels of xylazine prolong the duration of anaesthesia.

This observation is in agreement with Hsu & Lu (1984) and Hsu *et al.* (1986).

The duration of anaesthesia and recovery period of the T3 & T4 groups were significantly lower than that of C2 group, when reversed with 4-AP (2.5 mg/kg i.m.) indicating that 4-AP can be used successfully as reversing agent at this dose regimen of xylazine and Ketamine also.

Summary

An investigation was carried out to study the reversing effect of 4-AP on Ketamine-Xylazine anaesthesia (Ketamine 20 mg and Xylazine 10 mg/kg i.m. and (Ketamine 10 mg and Xylazine 20 mg/kg i.m.) in rats. The results of the study showed that there was significant reduction in the duration of anaesthesia and recovery from anaesthesia when 4-AP (2.5 mg/kg i.m.) was administered at 10 and 15 min after the induction of anaesthesia.

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