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COMPARISON OF INTRAMUSCULAR AND INTRAVENOUS INJECTION OF XYLAZINE — KETAMINE MIXTURE IN DONKEYS WITH AND WITHOUT ATROPINE PREMEDICATION

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COMPARAISON D'UNE INJECTION INTRAMUSCULAIRE ET INTRAVEINEUSE D'UN MELANGE XYLAZINE x KETAMINE CHEZ LES ANES AVEC OU SANS MEDICATION PREOPERATOIRE A L'ATROPINE

Résumé

Un mélange de xylazine Hcl et de kétamine Hcl dans une seringue a été utilisé pour comparer l'anesthésie après une injection intramusculaire (IM) et intraveineuse (IV). On a également évalué les effets du sulfate d'atropine.

Au total, 20 expériences ont été conduites chez 4 groupes de 5 ânes adultes chacun. Chez deux groupes, le mélange de médicaments a été injecté sans médication préopératoire à l'atropine; en revanche, on a administré l'atropine aux deux autres groupes 20 minutes avant l'injection du mélange de médicaments. Les paramètres anesthésiques et les changements de comportement ont été observés chez les animaux injectés IM et IV.

Les résultats ont montré que les deux voies d'aministration du mélange de médicaments étaient efficaces pour anesthésier l'âne. Même si l'injection IM avait un temps d'induction plus long, l'anesthésie durait plus longtemps que chez les animaux injectés IV. L'atropine a renforcé l'anesthésie. L'analgésie était présente dans toutes les parties du corps expérimentées, à l'exception de l'articulation distale et du boulet. Il y avait un relâchement des muscles. Les reflexes palpébral, du pied et anal étaient affectés.

L'administration par voie intramusculaire du mélange de médicaments s'est avéré plus souhaitable parce qu'elle est plus facile à effectuer et a une durée d'anesthésie plus longue.

Summary

A mixture of xylazine Hcl and ketamine Hcl in a syringe was used to compare anaesthesia after intramuscular (IM) and intravenous (IV) injection. The effects of atropine sulphate were also evaluated.

A total of 20 experiments were carried out in 4 groups of 5 adult donkeys each. In two groups the drug mixture was injected without atropine premedication and atropine was given to the other two groups 20 minutes before injection of the drug mixture. Anaesthetic parameters and behavioural changes were observed for the IM and IV injected animals.

Results showed that both routes of administration of the drug mixture were effective in anaesthetising the donkey. Although IM injection had longer induction time, the anaesthesia lasted longer than IV injected animals. Atropine enhanced anaesthesia. Analgesia was present in all parts of the body tested except distal to the fetlock joint. Muscle relaxation was present. Palbebral, pedal and anal reflexes were affected.

Intramuscular administration of the drug mixture was found more desirable because of ease in administration and longer duration of anaesthesia.

INTRODUCTION

Use of xylazine Hcl and ketamine Hcl combination has been reported in different animal species[1,2,3,4,5]. Recent research using xylazine Hcl and ketamine Hcl injected intramuscularly have shown that a mixture of the two drugs in the same syringe produces better results than when the individual drugs are given separately[6].

Further investigations to compare

intramuscular and intravenous routes of administation of the mixture of the two drugs were carried out. The present paper reports the results of the comparative study of the two routes of administration with and without atropine premedication.

Materials and Methods

Twenty experiments were carried out in 4 groups of 5 donkeys each. The donkeys weighed between 80 and 200 kg liveweight. These donkeys were examined to ensure that they were healthy before starting the experiments.

Atropine sulphate was administered subcutaneously at a total dose of 25 mg, 20 minutes before the injection of the drug combination in groups II and IV. Xylazine Hcl was given at 2.2 mg/kg IM and 1.1 mg/kg IV. Ketamine Hcl was given at 4.4 mg/kg IM and 2.2 mg/kg IV. The calculated dosages were mixed in one syringe and injected IM in each of the animals in group I and II and intravenously in each of the animals in group III and IV.

The following parameters were evaluated: Weak time (injection to staggering); recumbency time (injection to recumbency); analgesia (response to pin pricking of neck, flank, scrotum and extremities); reflexes (pedal, palperbral and anal); standing time (injection to standing unaided) and recovery time (when the animal walked and behaved normally).

Results

The durations of the different parameters are shown in Table 1.

To get to recumbency, the donkeys went on a dog-sitting position before collapsing into either a sternal or a lateral recumbency. Some animals alternated between these two positions. There was no paddling of the legs when the animals were in lateral recumbency. While recumbent the animals were quiet. Analgesia was good from the fetlock joint dorsally to the dorsal midline but was absent below the fetlock joint. Pain sensation was regained from the fetlock joint dorsally with the dorsal midline being last. Muscle relaxation was present in all cases but was good in IM injected animals and moderate in IV injected animals. Animals showed some degree of unconciousness as evidenced by lack of movement of ears when hands were clapped during recumbency.

Table 1: Average Duration (minutes) of various parameters after intramuscular and intravenous injections of the mixture of xylazine Hcl and ketamine Hcl with or without atropine premedication.

Parameter	Intramuscular		Intravenous	
	XK	AXK	XK	AXK
Weak Time	7.0	5.2	0.5	0.5
Recumbency Time	10.0	8.2	0.91	0.83
Standing Time	40.8	54.8	20.0	22.7
Recovery Time	177.0	212.0	51.7	56.7

XK — Xylazine-Ketamine.
AXK — Atropine-Xylazine-Ketamine.

To stand, animals went on a sternal recumbency, rested for a while and often made several attempts to stand. After standing there was staggering, wide base stance and lowering of the head. Animals were quiet during recovery and didn't react violently to noise around them. There was drooping of the lower lip and sneezing. Males protruded the penis and there was winking of the vulva lips in females. Sixty percent of the animals urinated after standing.

Discussion

The mixing of the two drugs in one syringe is desirable because it minimizes restraint of the animal and this is good as the donkey is usually fractious.

Since the donkeys are usually uncooperative during injection, it appears that the intramuscular injections is preferable. This is enhanced by the fact that the skin of the donkeys is very thick along the jugular groove. The intramuscularly injected drug though with a longer induction time, produces prolonged anaes-

thesia and better muscle relaxation than intravenous injection.

Atropine sulphate reduced induction time and increased anaesthetic time when the drug mixture was administered by both routes. This supports the observations in sheep[7].

The fact that only half of the dosage were used when the drugs were administered intravenously is an economic advantage.

The smooth induction and uneventful recovery observed in the donkeys is similar to what has been reported in horses[8].

Although presence of analgesia has been reported in other species[2,5,8,9] the absence of analgesia below the fetlock joint and gradual loss and regain of analgesia from distal extremities to dorsal midline in the donkey has not been previously reported in other species.

Loss of reflexes in the donkey resembles that of sheep[7] but differs with horses and cats where reflexes were not eliminated[9,10].

Muscle relaxation present in the donkeys has been reported also in horses[8].

Vulva winking and unconsciousness observed in this study have previously been reported[6].

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