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

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COMPARASION D'UNE INJECTION INTRAMUSCULAIRE ET INTRAVENUSSE D'UN MELANGE XYLAZINE KETAMINE CHEZ LES ANES AVEC OU SANS MEDICATION PREOPERATOIRE A L'ATROPIE

Résumé

Un mélange de xylazine HCl et de ketamine HCl dans une syringe a été utilisé pour comparer l'anesthésie après une injection intramusculaire (IM) et intraveineuse (IV). On a également évalué les effets de surdosage 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 médiation préopératoire à l'atropine en rebase. Les résultats de l'expérimentation ont été obtenus chez les animaux à 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'administration du mélange de médicaments débouchaient efficacement la douleur. Malgré l'injection IM ayant un temps d'induction plus long, l'anesthésie durait plus longtemps que chez les animaux injectés IV. L'expérimentation a montré que l'anesthésie était plus profonde dans les animaux injectés IV. Les paramètres de l'expérimentation et de l'anesthésie étaient plus favorables à l'anesthésie intraveineuse.

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 were also evaluated.

A total of 20 experiments were conducted on 4 groups of 5 adult donkeys each. In two groups, the drug mixture was injected without atropine premédication and atropine was given to the other two groups 20 minutes before injection of the drug mixture. Anaesthesia parameters and behavioral changes were measured for the IM and IV injected animals.

Results showed that both routes of administration of the drug mixture were effective in anesthetizing the donkey. Although IM injection had longer induction time, the anaesthesia lasted longer. Injected animals exhibited enhanced anaesthesia. Anaesthesia was profound in all parts of the body except the testis and the scrotum joint. Muscle relaxation was induced. Piloerection was present. Pallor of the pedal and ankle 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. 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.

Further investigations to compare...
in the intramuscular and intravenous routes of administration 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 live weight. These donkeys were examined to ensure that they were healthy before starting the experiments.

Atropine sulphate was administered intramuscularly at a total dose of 2 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 IV intravenously in each of the animals in group III and IV.

The following parameters were evaluated: Week time (injection to staggering); recumbency time (injection to recumbency); analgesia (response to pin prick of neck, flank, scrotum and extremities); reflexes (pedal, palpebral and anal); standing time (injection to standing unaided) and recovery time (when the animal walked and behaved normally). The results of the different parameters are shown in Table 1.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Intramuscular</th>
<th>Intravenous</th>
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<tbody>
<tr>
<td></td>
<td>XK</td>
<td>AXX</td>
</tr>
<tr>
<td>Week Time</td>
<td>7.0</td>
<td>5.2</td>
</tr>
<tr>
<td>Recumbency Time</td>
<td>16.0</td>
<td>8.2</td>
</tr>
<tr>
<td>Standing Time</td>
<td>40.8</td>
<td>54.8</td>
</tr>
<tr>
<td>RecoveryTime</td>
<td>177.0</td>
<td>212.6</td>
</tr>
</tbody>
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Table 1: Average Duration (in min) of various parameters after intramuscular and intravenous injections of the mixture of xylazine HCl and ketamine HCl with or without atropine premedication.

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 adduction 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 dor-sally with the dorsal midline being last. Muscle relaxation was present in all cases but good in IM injected animals and moderate in IV injected animals. Animals showed some degree of unconsciousness as evidenced by lack of movement of ears when hands were slapped during recum-bency.

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 wrinkling of the vulva lips in females. Sixty percent of the animals unitted 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 are 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-
thea 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.20
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.16
Although presence of analgesia has been reported in other species20 the absence of analgesia below the forlock 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 sheep20 but differs with horses and cats where reflexes were not eliminated20.
Muscle relaxation present in the donkeys has been reported also in horses.20
Vulva winking and unconsciousness observed in this study have previously been reported.21

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References

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