ANAESTHETIA IN DONKEYS USING KETAMINE ALONE AND KETAMINE XYLAZINE COMBINATION

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ANESTHESIE CHEZ LES ANES A L'AIDE DE LA KETAMINE UNIQUEMENT ET DE L'ASSOCIATION KETAMINE X XYLAZINE

Résumé

L'anesthésie avec la ketamine et la xylazine a été comparée chez deux groupes de dix ânes chacun. Le premier groupe (groupe A) a reçu une injection de ketamine uniquement et le second groupe (groupe B) une injection de ketamine et de xylazine. La ketamine a été injectée à dose de 4 mg/kg et la xylazine à la dose de 2 mg/kg. Dans tous les cas, les ânes étaient placés sur une table d'opérations. L'association de médicaments a permis d'obtenir une bonne induction et une durée plus longue de l'anesthésie (24,8 ± 15,8 minutes) par rapport à la ketamine seule (18,9 ± 5,4 minutes). Il n'y avait pas d'effets secondaires observables. La xylazine n'a pas eu d'effet sur les rythmes respiratoires et la pression artérielle. Il a été conclu que l'association ketamine xylazine est supérieure à la ketamine seule pour anesthésier les ânes.

Summary

Ketamine and xylazine combination was compared in two groups of 10 donkeys each. The first group (A) was injected with ketamine alone while the second group (B) was injected with ketamine-xylazine combination in the same syringe. Ketamine was injected at a dosage of 4.4 mg/kg and xylazine at a dosage of 2.2 mg/kg. In all the donkeys, the injections were given intramuscularly. The ketamine-xylazine combination provided a rapid induction of anesthesia (24.8 ± 15.8 minutes) as compared to ketamine alone (18.9 ± 5.4 minutes). There were no apparent side effects after the short duration under the drug combination. Ketamine-xylazine combination did not have a marked effect on the respiratory and heart rates whereas ketamine markedly increased these rates. The drug combination produced good muscle relaxation and recovery was uneventful, an advantage that ketamine lacked. It was concluded that ketamine-xylazine combination was better than ketamine alone for anaesthetizing donkeys.

INTRODUCTION

There is a need for reliable short term anaesthesia in the donkey under field conditions. An ideal anaesthetic should provide a rapid, quiet induction, good anaesthesia and muscle relaxation, minimal cardiovascular and respiratory changes, and a quick smooth recovery with minimal after effects so that the animal can be left unattended. Ketamine has been used successfully as an anaesthetic in several animal species including sheep, cattle and horses. The use of a combination of ketamine and xylazine with satisfactory results has also been reported in many animal species including horses, cats and dogs, cattle, sheep, camels and goats. There is no report on the comparison of ketamine alone and ketamine-xylazine.
combination in the donkey. This paper reports on the use of ketamine and ketamine-xylazine in the donkey.

Materials and Methods

Ten donkeys divided randomly into two groups of 5 animals each were used. They were of mixed sex, ranging from two to eleven years of age and weighing between 80 and 260 kg. All animals were healthy and microscopic fecal examination revealed all donkeys to be apparently free of gastrointestinal parasites. Food was withheld for 18 hours before each trial.

Group A animals were injected with ketamine alone and group B with ketamine-xylazine combination in the same syringe. In all instances, the injections were given intramuscularly at a dosage of 4.4 mg/kg for ketamine and 2.0 mg/kg for xylazine. Rectal temperature as well as heart rates and respiratory rates of each donkey were recorded before administration of the drugs, during anaesthesia and after full recovery. Analgesia was checked by pricking the skin with a hypodermic needle. Weak time, down to recumbency time, down time and standing time were recorded. Muscle relaxation rated as 1 (mild), 2 (moderate) and 3 (good) was recorded. Salivation, reflexes (pupillary, pedal and anal), ataxia and other behavioural changes associated with the drugs were checked for and recorded. Recovery was considered complete when the donkeys were able to walk unaided. The results were analyzed statistically using analysis of variance and covariance with repeated measures.

Table 1: Means ± s.d. for the Anaesthetics times (min.) for the two groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A (n=5)</th>
<th>Group B (n=5)</th>
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</thead>
<tbody>
<tr>
<td>Weak time</td>
<td>6.0 ± 1.8</td>
<td>7.0 ± 2.0</td>
</tr>
<tr>
<td>Down to Recumbency time</td>
<td>11.0 ± 3.5</td>
<td>10.0 ± 2.4</td>
</tr>
<tr>
<td>Standing time</td>
<td>25.0 ± 7.1</td>
<td>40.7 ± 3.0</td>
</tr>
<tr>
<td>Down time</td>
<td>38.8 ± 9.4</td>
<td>34.9 ± 12.9</td>
</tr>
<tr>
<td>Unconsciousness time</td>
<td></td>
<td>17.1 ± 3.8</td>
</tr>
<tr>
<td>Recovery time</td>
<td>124.0 ± 26.6</td>
<td>117.0 ± 21.6</td>
</tr>
</tbody>
</table>
the donkeys injected with ketamine alone. However, these changes were not significant (P>0.05).

Muscle relaxation was good during anaesthesia when the combination was used but absent when ketamine alone was used (Table 2). The drug combination ketamine-xylazine produced surgical anaesthesia of short duration of the neck, inguinal area and extremities except below the fetlocks whereas ketamine alone did not produce any analgesia.

The drug combination eliminated the pedal reflex during recumbency and weakened the palpebral and anal reflexes within the first hour following the injection of the drug combination. However, ketamine alone did not affect the reflexes.

**Discussion**

In an attempt to achieve smoother induction and recovery from anaesthesia, to intensify analgesia and to decrease the amount of anaesthesia drugs needed, combinations with different doses of sedatives or analgesics have been reported in various animal species. The smooth induction and quiet recovery in donkeys injected with the drug combination ketamine-xylazine agrees with findings in horses.

The excessive muscle tremors, rigidity and continuous paddling due to ketamine make it undesirable for use in donkeys as compared to the ketamine-xylazine combination which provided good muscle relaxation and uneventful recovery. The undesirable effects due to ketamine have also been reported in horses.

The drug combination ketamine-xylazine produced good analgesia adequate for surgical manipulations of short duration but ketamine alone produced no analgesia which supports the findings in horses and in camels.

Ketamine on its own produced marked increase in the heart rate and respiratory rates. But, in the presence of xylazine, the effects of ketamine were subdued thus making the combination superior to ketamine alone. Although the 'kneeling', grunting and snorting noticed either with ketamine alone or ketamine-xylazine combination were not uneventful, they have not been reported in donkeys.

The insignificant changes in rectal temperature due to either ketamine or ketamine-xylazine combination have also been reported in sheep.

Drooping of the lower lip and protrusion of the penis can be attributed to the
effects of xylazine as reported in horses.

The desirable attributes of the drug combination ketamine-xylazine of smooth induction, longer duration of anesthesia, good muscle relaxation, analgesia and uneventful recovery make it superior to ketamine which should not be used alone for donkey anesthesia due to its undesirable effects.

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References


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