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**ROMPUN IN COMPARISON WITH LIDOCAINE
FOR EPIDURAL ANALGESIA IN RABBITS**
(With 3 Figs.)

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عقار الريمبون بالمقارنة بعقار الليدوكاين
للتخدير الجزئي حول الأم الجافية في الأرانب

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قد تم تقييم عقار الريمبون بالمقارنة بعقار الليدوكاين للتخدير الجزئي بالحقن حول الأم الجافية في 6 أرانب ، وأختبر عدم احتمال التأثير الجهازى لعقار الريمبون عند الحقن حول الأم الجافية بالمقارنة بنتائج الحقن العضلي له . ولقد أحدث عقار الريمبون بعد الحقن حول الأم الجافية بجرعة 7 مجم / كجم من وزن الحيوان تأثير مساوي تقريبا لتأثير حقن عقار الليدوكاين (محلول 2% بجرعة 2/1 مللي / 20 سم من طول الحيوان . وبينما أحدث عقار الريمبون حول الأم الجافية تأثيرات مهدئة ، لم يؤدي الحقن العضلي الي تخدير جزئي هذا وقد أدى العقار الي إرتخاء واضح في القوائم الخلفية للحيوانات بالإضافة الي التخدير الجزئي وذلك بعد الحقن حول الأم الجافية . لذلك يمكن إستخلاص أن عقار الريمبون والليدوكاين يمكن إستخدامهما بأمان كمخدر جزئي بالحقن حول الأم الجافية في الأرانب .

SUMMARY

Rompun in comparison with Lidocaine for lumbosacral epidural analgesia was evaluated in 6 rabbits. To rule out the possibility that the epidural Rompun acted by systemic absorption, the intramuscular effects of the drug were also tested.

Epidural administration of Rompun (7mg/kg B wt) induced epidural analgesia nearly equivalent to Lidocaine, 2% solution (0.5 ml/ 20 cm from the animal length). While the epidural injection of Rompum caused some behavioral changes, the intramuscular administration had no epidural effects. The Epidurally injected drug induced a pronounced hind limbs muscle relaxation. Both Rompun and Lidocaine may be considered safe and efficacious lumbosacral epidural analgesics for rabbits.

INTRODUCTION

Untreated pain in research animals is not only inhumane, but also adversely influences the validity of many research models. The rabbit is frequently considered to be perhaps the most difficult research animal to anaesthetize safely. It has a relatively small thorax. The ratio of tidal volume to body weight is exceptionally small in rabbits. There is a high incidence of underlying respiratory disease in clinically normal research rabbits. Endotracheal obstruction is a common anaesthetic problem. With the susceptibility to injectable anaesthetic agents, there is considerable variation between rabbit breeds and even among animals within the same breed (SHORT, 1987).

Recent reports document the effective use of epidural Rompun to produce epidural analgesia in cattle, horses, and ponies. Epidural Rompun-induced analgesia has advantages in comparison with epidural Lidocaine (CARON and LeBLANC, 1988; FIKES, *et al.* 1988; LeBLANC and EBERHART, 1988 and FIKES, *et al.* 1989). The epidural Rompun does not cause significant physiologic stress (LeBLANC and EBERHART, 1988).

This study was designed to evaluate the effects of Rompun in comparison with Lidocaine as epidural analgesics for rabbits.

MATERIAL and METHODS

A number of 6 adult, clinically healthy rabbits weighing 1200 to 1600 gm, were used in the present study.

Rompun (Haver, Mobay Corporation, Animal health division, Shawnee, Kansas, 66201, USA) was injected epidurally; through the lumbosacral space. The drug was administered in dose rates of 5, 7 and 10 mg/kg B wt. The given dose was diluted with normal saline to the volume equivalent to 0.5 ml/ 20 cm from the animal length. The same animals were used for the different dose rates after the elapse of one week between the successive treatments. To rule out the possibility of the systemic action of the epidurally injected Rompun, the drug was administered intramuscularly, in a dose rate of 10 mg/kg B wt.

Lidocaine (Astra, Sodertalje, Sweden) was injected as 2% solution into the epidural space of the same animals in a dose rate of 0.5 ml/ 20 cm from the animal length. Analgesia was evaluated by the absence of the reflex to needle prick. Any behavioral changes were recorded.

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RESULTS

Analgesia began within one and half minute after the epidural administration of Rompun in a dose rate of 5 mg/kg. B wt. Desensitization extended cranially to the level of the last three ribs. Relaxation was pronounced in the hind limbs (Fig. 1) and anal opening. Although the hind limbs were relaxed the animals were able to drag the body by the aid of the fore limbs (Fig. 2). Analgesia and hind limbs relaxation began to disappear within 30 minutes from injection but the animals ability to walk remain incomplete for about 15 minutes more.

With regard to the behavioral changes, the animals began to be calm leaving the head to lie on one of the fore limbs or on the ground within 15 minutes after the epidural injection of rompun in a dose rate of 5 mg/kg Bwt. Sometimes the animals leave the head to lie caudally in star gazing position (Fig. 3). The animals remain in the tranquillized state for 45 minutes after the epidural injection of the drug. They became able to walk and behave normally within 55 minutes.

After epidural administration of Rompun in a dose rate of 7 mg/kg Bwt., analgesia began within half a minute and extended cranially to the level of the middle of the chest wall. The effect persisted for 45 minutes. When a dose rate of 10 mg/kg Bwt, was used, the effect appeared within half a minute and persisted for 55 minutes. The animals appeared more relaxed to the degree that the fore limbs were extended forward and the animal lost the control to keep himself in the sternal recumbency position. Although the movement of the hind limbs began after 55 minutes, the animals took 68 minutes to be able to walk in a normal manner.

The intramuscular administration of Rompun in a dose rate of 10 mg/kg Bwt. for rabbits caused some behavioral changes. The effects appeared within 12 minutes and persisted for 70 minutes. Although the animals were calm, laying the chin on the ground, and in an atrance resembling sleep, they did not lose the control on the hind limbs. The reflexes including the anal reflex and achilis tendon reflex did not disappear, but slightly diminished. Frequent urination was observed after administration of the drug.

Analgesia developed just after the lumbosacral epidural injection of Lidocaine (2% solution) in a dose rate of 0.5 ml/20 cm from the animal length. The analgesia extended cranially to the level of the last three ribs. While analgesia disappeared within 48 minutes after the epidural injection of Lidocaine, the animals were able to walk normally within 55 minutes.

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DISCUSSION

Rompun has a powerful and reversible local anaesthetic effect (AZIZ and MARTIN, 1978). The drug-induced analgesia is thought to be due to stimulation of peripheral alpha receptors (SCHMITT, et al. 1974) and central alpha receptors (SCHMITT, et al. 1974 and BROWNING, et al. 1982).

Epidural administration of Rompun (7 mg/kg Bwt) induced epidural analgesia nearly equivalent to Lidocaine, 2% solution (0.5 ml/20 cm from the animal length). The epidural effect of the drug developed faster than the behavioral changes. This may be explained on the bases that the epidural analgesia may be related to the local action of the drug directly on the alpha adrenoceptors which may be found in the spinal cord (UNNERSTALL, et al. 1984; and GIRON, et al. 1985). The behavioral changes are related to the action of the drug on the central alpha receptors (SCHMITT, et al. 1974 and BROWNING, et al. 1982). The drug may need some time to be at the therapeutic level at the central receptors.

While it was recorded by LeBLANC, et al. (1988) that the epidural administration of Rompun in horses produced analgesia with minimal effect on motor nerve function, muscle relaxation was pronounced in rabbits hind limbs. On the contrary the effect on the fore limbs was minimal where the animals were able to drag the body by the aid of them.

While it was stated by LeBLANC and CARON (1987) that sedation was not apparent after epidural Rompun in horses, it was pronounced in rabbits. This may be attributed to the difference in the susceptibility between the horses and rabbits to the systemic effect of the drug.

The intramuscular administration of Rompun in rabbits had no epidural effect, while the epidural injection of the drug had a pronounced systemic effect at the same dose level. This could be explained on the bases that the epidural effect is related to the local action of the drug which is also absorbed to give the systemic effect. CARON and LeBLANC (1988) used the intramuscular injection of Rompun in cattle to rule out the possibility that the epidural Rompun acted by systemic absorption.

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