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EPIDURAL INJECTION OF XYLAZINE /NOVOCAIN MIXTURE IN DONKEYS

L. M. Alkattan
Department of Surgery and Obstetrics, College of Veterinary Medicine, University of Mosul, Mosul, Iraq

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ABSTRACT

This study was conducted on nine adult donkeys from both sexes to determine the ideal dose and efficiency of Xylazine/Novocain mixture for inducing a good and safe epidural analgesia. This mixture was injected between the first and second coccygeal vertebrae. The results indicated that the efficiency of Xylazine 2% at a dose 0.8 mg /kg.BW mixed with Novocain 2% at the dose 0.1ml/kg.BW induced good safe epidural analgesia in donkeys.

الحقن فوق الجافي لمزيج الزايلازين /نوفوكائين في الحمير

ليث محمود القطان
فرع الجراحة والتوليد، كلية الطب البيطري، جامعة الموصل، موصل، العراق

الخلاصة

تم إجراء هذه الدراسة على تسعة حمير بالغة من كلا الجنسين لتحديد الجرعة المثالية لمزيج الزايلازين /نوفوكائين وكفاءتها لإحداث تسكين فوق جافي جيد وأمين. حيث تم حقن هذا المزيج بين الفقرة الذيلية الأولى والثانية .أثبتت النتائج كفاءة مزيج الزايلازين /نوفوكائين وبجرعة ٠,٨ ملغم /كغم من وزن الجسم الحي ٢% زايلازين+١,٠مل/ كغم من وزن الجسم الحي ٢% نوفوكائين لإحداث تسكين فوق جافي جيد وأمين في الحمير.

INTRODUCTION

Local and regional anesthetic techniques are useful tools for the equine practitioner. These techniques allowed to be performed with out the cost of general anesthesia (1). Epidural injection or extradural injections define a method of injection anesthetic agents, analgesic drugs and sedative agents through the vertebral canal out of dura matter (2-4), this technique is commonly used in equine (5), and donkeys (6). It is made by sterile injection of local analgesic agents through the intercoccegeal space between the first and second coccegeal vertebrae (7-9). It was classified according to the site of the injection in the body involved by the analgesia; caudal epidural analgesia, anterior epidural analgesia (10). Lidocaine, it is one of the most local analgesic agents that, commonly used alone or with another agent as Xylazine (X) to induce epidural analgesia in animals (5,10). Utilizing this combination, long-duration for obstetrical and surgical procedure could commence relatively soon after epidural injection and

could be completed without re-administration of anesthetic agents (11) .On other hand, Novocain (N) another type of local anesthetic agent that used in horse to induce epidural analgesia, muscle relaxation for surgical intervention as amputation of tail (docking), rectal and vaginal prolapse and obstetrical interference (12,13). Alpha 2-adrenergic agents Xylazine and medetomidine, effectively produced analgesia in the perineal, flank, udder and lower abdominal region after epidural injection in cattle, goat and horse (8, 9,14).

The aim of this study was to determine the ideal dose and efficiency of Xylazine/ Novocain mixture (X+N) for surgical intervention for the caudal regions of the body.

MATERIALS AND METHODS

Nine healthy donkeys of both sexes were used in this study .Their weight and ages ranged between 85-95 kg, 3-5 years, respectively. The animals were housed in the House of animals, of Veterinary Medicine College, Univercity of Mosul. The animals were divided into two groups:

Group 1: This group composed from five animals. The ideal dose of epidural (X), (N), and (X+N) were compared for inducing epidural analgesia. The animals treated with (X) 2% (Sanofi Company/ France) at different doses of (0.5, 0.75, 0.8, 0.9, 1.0) mg /kg, B.W., to determine the ideal dose of (X). The ideal dose obtained was 0.8 mg/kg, B.W., that diluted into 10 ml with 0.9% NaCl solution (Total volume of injected (X) was 1 ml/10kg, B.W). After 20 days the same animals were treated with (N), (Kazan Company/Russia) in different doses of (0.05, 0.1, 0.25, 0.5, 1.0) ml /kg to determine the ideal dose (Total volume of injected (N) was 1 ml/10kg, B.W.). After a period of 20 days, the same animals were treated with mixture of (X) 2% at 0.8 mg/kg / (N) 2%of 0.1ml/ kg, the total volume of (X+N) was1ml/10kg. The site of injection was at the dorsal aspect between the first and the second intercoccygeal vertebrae prepared aseptically with routine preparation. The technique performed by rising the tail up and down to determine the proper site, the first interspaces is readily located in most horses by palpating the first movable coccygeal articulation with the finger while raising the tail (16), hypodermic needle, 18G", 3.7cm length, was used for epidural injection. Correct needle placement was confirmed by noting of negative pressure and minimal resistance to the injection, the drug was administered slowly over 30 second (3,16). At this group the following parameters were determined; The onset of analgesia, time to sedation, duration and degree of analgesia which was measured by the donkeys response to needle pricks over the tail, perineum region, scrotum and flank regions.

Group 2: Four animals were treated with the ideal dose as a mixture of (X+N): by the same manner as in group 1. The animals were observed and physically examined. The donkeys heart rate, respiratory rate was determined before and after10, 20, 30, 40, 50, 60 min of injection to record the behavior of animals. Castration was applied on four donkeys of this group after treatment by this mixture. At this group the same manner of parameter was taken as group 1. Data statistically analyzed by one way analysis of variance. The level of significance was at $p< 0.05$ (21).

RESULTS

The results of this study were revealed that the ideal dose of epidural (X+N) was 0.8 mg, 0.1 ml/kg BW, respectively. The administration of (X) at the doses (0.5, 0.75) mg /kg BW mixed with (N) at the dose 0.1ml/Kg BW exhibited mild sedation and the animals were alert, while epidural injection of this mixture at the doses (0.9, 1.0) mg /kg BW (X) mixed with (N) at the dose 0.1ml/Kg BW produced undesired side effects as deep sedation inability to stand, tremor, dropping of the head, profuse salivation and recumbency. The epidural injection of (X) at the dose 0.8 mg /Kg BW mixed with (N) at the dose 0.1ml/Kg BW produced good and safe analgesia with moderate signs of sedation and sweating at the region of tail and perineum three animals. This dose induced analgesia, the onset of action was significantly shorter (7.6±1.8 min) than the onset of action following (X) (10.1±2.9 min) of injection and the time to sedation was significantly shorter (9.0±1.0 min) as a compared to epidural (X) (6.8± 0.8 min), (N) (zero) when given as alone. The using of pine prick indicated that the used dose of this mixture produced good and safe analgesic effects with good relaxation of tail. The time of duration of analgesia of the tail, anus, scrotum, perineum and hind limbs after epidural (X+N) were (50.6±9.2 min), (40.8±6.4 min), (34.6±6.7 min) (31.2±5.3 min), (14.8±2.4 min), respectively as compared with that produced by epidural (X), and (N) alone. The duration of action at the perineum and hind limbs was significantly longer after injection of this mixture as compare to the (X), (N) alone, (Table 1). The results of this trail shown that epidural injection of this mixture led to significant decreased in the heart rate after 30 min (64.0±6.3 beat/min) and returned to the normal levels after 60 min of injection (78.2 ±3.9 beat /min) as compared to pre treatment, there is significant decrease in respiratory rate after 30 min of injection (20.4±2.6 breath/min) and mild increased after 60 min, (Table 2).

Castration applied on four animals after 20 min of epidural injection of ideal mixture under dorsal recumbency, the operation was performed safety and without sensation.

Table 1: Onset, duration of action and time to sedation after (X), (N) and (X+N) mixture n=5.

Variables	Onset of action	Time to sedation	Duration of action				
			Tail	Anus	Scrotum	Perineum	Lower limb
(X)2% 0.8 mg/kg BW	10.1± 2.9	6.8± 0.8	43.5± 3.3	38.0± 3.9	31.0± 4.0	12.0± 6.1	10.6± 2.1
(N)2% 0.1 ml/kg BW	8.0± 1.8 *	Zero *	40.8± 5.0	43.0± 3.9	22.0± 5.1 *	26.8± 5.6 *	11.2± 1.2
(X+N) 0.8 mg+0.1 ml kg BW	7.6± 1.8 *	9.0± 1.0 *	50.6± 9.2	40.8± 6.4	34.6± 6.7	31.2± 5.3 *	14.8± 2.4 *

(*) data significant at ($p < 0.05$).

Table 2: The Heart rate (HR) and Respiratory rate (RR) after (X+N). n=4

	Before injection	After 10 min of injection	After 20 min of injection	After 30 min of injection	After 40 min of injection	After 50 min of injection	After 60min of injection
RR	28±4.8	24.2±4.1	21.8±2.3	20.4±2.6*	21.4±2.9	29.2±2.8	31.6±3.3
HR	81.0±8.5	70±11.5	70.2±9.3	64.0±6.3*	64.0±4.6	72.4±7	78.2±3.9

(*) data significant at ($p < 0.05$)

DISCUSSION

Epidural administration of (X+N) at a dose of 0.8 mg/kg. B.W., 0.1ml/kg., B.W. respectively, produced good epidural analgesia with rapid onset of action with mild degree of sedation which was adequate for surgical intervention at caudal regions of the body (tail, perineum, scrotal and flank regions). In present experiment the results indicated that the ideal dose of (X+N) was 0.8 mg/kg., B.W., (X) mixed with 0.1ml/kg., B.W., (N). This adequate for inducing good analgesia and loss of pain refluxes and relaxation of tail. In all donkeys (X), administered either alone or with N, induced mild and moderate sedation, the time to sedation was significantly longer (9.0±1.0) min, than that produced by (X) alone. The onset of action was significantly shorter (7.6±1.8) min as compared with injection (X) alone (10.1±2.9 min) and this agrees with other workers (9,11). On other hand, no signs of sedation were observed after epidural (N) alone. Epidural lidocaine produced marked ataxia was observed due to motor block to the nerves when reached to the lumbosacral plexus (9). In present investigation, mild degree of ataxia and this agree with (5,8,9,18). The usual side effects (i.e., vagally stimulated bradycardia) produced by (X), although observed on our experimental animals but their significance was less, and these agree with the observation of (8,17,18). In this study there were signs of sweating at the tail and hind limbs in three animals after 9-6 minutes of injection, which indicated analgesia of the area. It might be due the effect of (X) on sweat glands and this agree with (8,9). The mixture of (X+N) produced good analgesia and allowed to perform castration in four animals .This results indicated that the mixture of these drugs allows to perform many surgical operations at the caudal region of the body. The decrease in heart rate 30 min after epidural (X+N) mixture, may be due to baroreceptor mediation which increases the vagal tone which may produce sever bradycardia and respiratory rate decrease after 30 min which may lead to respiratory depression and hypoventilation (8, 20, 22).

The use of (X+N) mixture in donkeys has been not mention in literature.

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