Epidural analgesia with Xylazine/ Novocain mixture in local Iraqi goats

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Abstract

The present trail has been designed to investigate the effect of the Xylazine/Novocain mixture in producing effective safety analgesia by caudal epidural injection in goats. Caudal epidural injection of Xylazine HCL 2 % (0.01mg/kg BW), Novocain 2% (3.5mg/kg BW) and mixture of Xylazine / Novocain (0.01 mg/kg BW, 3.5mg/kg BW), respectively have been injected at 2% concentration for each solution. The results of this trial shown that, caudal epidural injection of Xylazine, Novocain alone or in a combination of both of them produced an effective and safe analgesia in goats and the efficiency of the Xylazine / Novocain mixture was much better for longer duration than that for each drug alone. The mixture of Xylazine / Novocain led to complete loss of pain reflexes at the caudal region, while the animals remain in standing position. An opened method of surgical castration has been performed on two male goats with complete loss of pain reflexes during this procedure; we recommended the using of this mixture clinically.

Introduction

Analgesia is a state of alleviation or appreciation of pain without loss of consciousness(1). There are many methods and many agents which have been used to produce analgesia. Epidural anesthesia is one of the most common methods which is firstly recorded in dog in (1901) and used successfully in human and animals because of it’s less neurological complications (1,2,3 and 4). The epidural injection of conventional local anesthetic drug used to block the sensory, sympathetic and motor fibers indiscriminately; it may cause hypotension, increase heart rate and respiratory rate, and ataxia(5). Xylazine, is a sedative, analgesic, muscle relaxant and non narcotic agent which is acts on the central nervous system have been used in all farm animals alone or in combination with other agents (6). It is an alpha 2 adrenergic agent produce an excellent analgesic effect in caudal region and in dog and goat when given epidurally(7). This agent is useful for surgery, cranial to perennial area in goats(8). Ruminates generally are not considered to be a good subjects for general anesthesia especially due to the hazard of regurgitation and swallowing of ruminate contents or saliva into the lungs if the airway are left unprotected (10) thus, regional analgesia produced by epidural injection are most frequently employed in these species. The most common anesthetic agents that have been used in small ruminates practice include lignocaine (11,12and13), Xylazine (11), Novocain(3) and lignocaine, detomidine in donkeys (9). Xylazine used alone or combined with other agents as lidocaine diluted to adequate amounts with sterile water to provide a longer duration of action (14, 15 and16). The use of Xylazine / Novocain mixture in goats has not been reported yet.

Materials and Method

This trail performed on 15 adult goats of local breed aged (2.0±0.5) years and weighted (23 ± 3.0 kg) were used. The goats were in good physical condition, goats (3 groups) have been injected by caudal epidural administration with one of the following solutions: Xylazine (X), HCL (Rumpon®), (pantex company .Holland). At 0.01 mg/kg, 2% concentration diluted into 2 ml volume with normal saline (0.9% NACL) solution. Novocain (N) (crystal powder, Kazan Com. for drugs, Russia.) at 3.5mg/kg BW (2% concentration). (Solution was prepared
aseptically by dissolved 2g in 100 ml D.W). Xylazine and Novocain, the volume of solution epidurally injected according to the weight of animals. (X) at 0.01 mg/kg BWt with Novocain of 3.5mg/kg BW .The dose of (X+N) were obtained after experimental setting by using different doses from (X) at 0.005,0.01,0.015,0.02)mg/kg BW, (N)at (2.5,3.0,3.5,4.0) mg/kg BW, the selection of the doses ideal doses randomly conducted as same manner in all treatments. Following parameters were dependent to determine the ideal doses the onset of action, duration and degree of analgesia which was determined by animals response to pin prick, time to recumbence and time to sedation. The site of injection which is between the first and second coccygeal vertebrae (CX 1 – CX 2) prepared in aseptic condition and the injection through epidural space between the two vertebrae, that palpated by moving tail up and down with hand, while palpating of the dorsal spines of sacrum and coccygeal vertebrae with other hand (14,17).Data statistically analyzed by one way analysis of variance. Group differences were determined by using Duncan multiple range tests. The level of significance was at p < 0.05 [18].

Results

Both solutions of (N) and (X) appeared miscible in one syringe as no color change or precipitation resulted from mixing. The results of this study shown that, the mixture of (X+N) induced good epidural analgesia. The time to recumbence were significantly shorter with epidural (N) at (2.5 ± 3.0 min) of injection than (X) alone, (X+N) mixture. Which were (7.5 ± 2.4, 7.0 ± 1.6 min), respectively (Table1). The analgesia produced by (X)at the doses (0.015,0.02) mg/kg BW with different doses of (N) were associated with severe weakness and incoordination of hind limb (ataxia), which lead to recumbence, so this doses out of use in this study. Administration of (N) at 3.5 mg/kg BW mixed with (X) at 0.01 mg/kg BW significantly resulted into complete loss of sensation of the tail and scrotal region (57±7.6, 29.2±2.5 min), respectively whereas epidural (X) alone at 0.01mg/kg BW, the complete loss of sensation of the tail and scrotal region were (48.7± 3.7, 20.5 ± 3.4 min), respectively. Epidural (N)alone at 3.5mg/kg BW, the complete loss of sensation of the tail and scrotal region were in average (43±7.1, 18±2.1 min), respectively (Table 1).The treated goats exhibited some systemic effects of mixture .These signs included good deal of sedation and low head carriage, excessive salivation with drooling and rumen distention, these signs were notice on an average, about 10 min. after epidural injection and persisted for the 65 min, so the time to sedation was (6.6 ±1.1 min) of treatment with this mixture, such signs were observed with (X) epidurally as alone, but with different degree, the time to sedation was (7.5 ± 0.6 min), while such signs not observed after epidural (N) as alone.
Table (1) The time to recumbence, sedation and duration of analgesia after epidural (X), (N) and (X+N), n=15

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time to recumbence (min)</th>
<th>Time to Sedation (min)</th>
<th>Duration of analgesia (Complete loss of sensation) (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tail</td>
</tr>
<tr>
<td>(X) 0.01 mg/kg BW</td>
<td>(7.5 ± 2.4)</td>
<td>(7.5 ± 0.6)</td>
<td>48.7 ± 3.7</td>
</tr>
<tr>
<td>(N) 3.5 mg/kg BW</td>
<td>(2.5 ± 3.0)</td>
<td>Zero</td>
<td>43.7 ± 7.1</td>
</tr>
<tr>
<td>(X+N) 0.01/kg, BW + 3.5 mg mg/kg BW</td>
<td>(7.0 ± 1.6)</td>
<td>(6.6 ± 1.1)</td>
<td>57 ± 7.6(*)</td>
</tr>
</tbody>
</table>

(*) data significant at (P < 0.05).

Discussion

The results of this trail showed that the epidural analgesia that produced with (X+N) mixture in goats had long duration of action than the (X), (N) alone, shorter duration of recumbence than (X) alone but differ from (N) as alone. Sedation has been recommended for routine use in animals to facilitate epidural administration of anesthetic agents (8,11,15), so in our trail the time to sedation after epidural injection (X+N) mixture at the dose 3.5mg /kg BW, (N)+ 0.01mg/kgBW, (X) was (6.6 ± 1.1 min.), due to mild depression of CNS (1), whereas after epidural (X) alone was (7.5 ± 0.6) min. as well as evident signs of sweating of tail, perineum region after 15 min of injection this agrees with (8,17,19) this may be due to the effects of xylazine on sweating glands, but there are no signs of sedation after epidural (N) (an ester type of local anesthetics) this may be due to the effects of Novocain as local anesthetic agent. In this study a (X+N) mixture provided rapid onset of action and prolonged, duration of analgesia (complete loss of sensation) were longer than other group specially tail, perineum region (57.0±7.6, 55.0±5.4 min), respectively. The combinations of different analgesic were invariably attempted in clinical practice to improve the quality of analgesia with minimum side effects (20). After epidural (X) alone the duration of analgesia of tail and perineum region was (48.7± 3.7, 36.7±3.7 min), respectively. After epidural (N) alone there were less duration of analgesia in all region than the mixture. In conclusion, following epidural administration of (N) at 3.5mg /kg BW mixed with (X) 0.01 mg/kg BW produced good, effective analgesia and can be successfully used opened surgical method of castration in local breed male goats.

References


التسكين فوق الجافبة لمزيج زايلازين/ نوفوكائين في المعز العراقي المحلي

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الخلاصة

صممت تجربة هذه الدراسة الحالية لمعرفة كفاءة مزيج الزايلازين مع النوفوكائين في أحداث تسكين فوق جافي خلفي جيد وامين في المعز. حققت المعز في الحيز فوق الجافبليزالازين2% (0.01 ملمغ/ كغم وزن الجسم) والنوفوكائين 2% (3.5ملم/ كغم وزن الجسم) ومزيج الزايلازين والنوفوكائين بجرعة (0.01ملم/ كغم و 3.5ملم/ كغم وزن الجسم) على التوالي وتركيز 2% لكل منهما أظهرت نتائج هذه الدراسة ان اعطاء الزايلازين وال نوفوكائين لوحدهما أو اعطانهما معاً أدى إلى احداث تسكين فوق جافب جيد في المعز، وان كفاءة مزيج الزايلازين والنوفوكائين كانت أفضل بكثير ولقترة اطول مما هو عليه الحال لو أعطى كل دواء لوحده اذ ادى اعطاء المزيج الى فداد كامل لمنعكسات الالم في الجزء الخلفي من الجسم مع بقاء الحيوان في وضع الوقف، هذا وقد أجريت تداخلات جراحية بالطريقة المفتوحة لخصي اثنين من الذكور مع اعطاء فداد كامل لمنعكسات الالم بالالم طيلة فترة اجراء العملية الجراحية. نوصي باستخدام الزايلازين والنوفوكائين سريرياً.