

# Local, Regional, and Spinal Anesthesia in Ruminants



Misty A. Edmondson, DVM, MS

## KEYWORDS

• Anesthesia • Local • Regional • Spinal cattle • Sheep • Goats

## KEY POINTS

- Local, regional, and spinal anesthesia techniques are safe and effective methods for providing anesthesia for common surgical procedures and painful conditions in cattle and small ruminants.
- These techniques are inexpensive and easy to perform and offer a safe alternative to general anesthesia, in some cases.
- Many surgical procedures can be performed safely and humanely in ruminants using a combination of physical restraint, mild sedation, and local, regional, or spinal anesthesia.

## INTRODUCTION

Although general anesthesia is commonly used in cattle and small ruminants, there are some risks associated with using general anesthesia. An alternative in some cases may include the use of local, regional, or spinal anesthesia. Local, regional, or spinal anesthesia is safe, effective, and often a more desirable procedure in many situations. Many surgical procedures can be performed safely and humanely in ruminants using a combination of physical restraint, mild sedation, and local, regional, or spinal anesthesia. Local anesthetic techniques are popular and used commonly because they are usually simple and inexpensive and provide a reversible loss of sensation to a relatively well-defined area of the body. Local and regional anesthetics also offer some advantages over general anesthesia, which include a lower risk of toxic effects, decreased risk associated with placing an animal in recumbency (bloat, regurgitation), and the need for less equipment. Before local or regional anesthesia is performed, the animal should be adequately restrained. The type of restraint used depends on the temperament of the animal and the anesthetic technique to be used. However, sedation may be necessary in some cases. The site of injection should be prepared by clipping or shaving the hair and scrubbing and disinfecting the skin.

---

The author has nothing to disclose.

Department of Clinical Sciences, Auburn University College of Veterinary Medicine, 1500 Wire Road, Auburn, AL 36849, USA

*E-mail address:* [abramms@auburn.edu](mailto:abramms@auburn.edu)

Vet Clin Food Anim 32 (2016) 535–552

<http://dx.doi.org/10.1016/j.cvfa.2016.05.015>

[vetfood.theclinics.com](http://vetfood.theclinics.com)

0749-0720/16/\$ – see front matter © 2016 Elsevier Inc. All rights reserved.

## LOCAL ANESTHETICS

There are many local anesthetic agents that may be used for these procedures. These anesthetic agents vary in their potency, toxicity, and cost.<sup>1</sup> Two percent lidocaine hydrochloride and 2% mepivacaine hydrochloride have become the most commonly used local anesthetic agents in cattle because of low cost and limited toxicity. Lidocaine is 3 times more potent than procaine and diffuses more widely in the tissues. Lidocaine also has an intermediate duration of action from 90 to 180 minutes, is 3 times more potent than procaine, and diffuses into tissues more widely.<sup>2,3</sup> A vasoconstrictor, such as epinephrine (5 mg/mL), added to the local anesthetic solution (0.1 mL of epinephrine [1:1000] to 20 mL of local anesthetic) increases the potency and duration of activity of both regional and epidural anesthesia. However, anesthetic agents containing epinephrine (1:200,000) should not be used in wound edges or in the subarachnoid space because of the risks of producing tissue necrosis and spinal cord ischemia.<sup>3</sup> In cattle, procaine (1%–2%) is expected to have a longer time to onset of anesthesia when compared with lidocaine and a shorter duration of action at no more than 60 minutes. Alternatively, mepivacaine (1%–2%) is expected to have a similar time of onset of anesthesia but longer duration of activity at 120 to 180 minutes when compared with lidocaine. Bupivacaine (0.25%–0.5%) is a long-acting local anesthetic lasting up to 360 minutes. However, bupivacaine can be toxic to cattle if it is given intravenously. Hence, bupivacaine is not recommended for routine clinical use because of the risk of inadvertent intravenous injection (5 = 1<sup>4</sup>).

It is imperative for the clinician to be conscious of toxicity and preventative measures to ensure that overdosage does not occur. Avoiding an overdose is critically important when local anesthesia is being performed in a large area, such as for cesarean section. The maximum safe dose of lidocaine hydrochloride in cattle is 10 mg/kg of body weight. Small ruminants are exquisitely more sensitive to anesthetics with a maximum safe dose of lidocaine hydrochloride of 4 mg/kg (5 = 1<sup>4</sup>). In some cases where a larger area is to be covered and thus a larger volume is needed, the standard 2% lidocaine hydrochloride may be diluted to 1% with sterile saline.

## ANESTHESIA FOR DEHORNING

The corneal nerve block is used for anesthesia for dehorning cattle and small ruminants. The horn and the skin around the base of the horn are innervated by the corneal branch of the lacrimal or zygomaticotemporal nerve, which is part of the ophthalmic division of the trigeminal nerve. The corneal nerve passes through the periorbital tissues dorsally and runs along the frontal crest to the base of the horns. Approximately 5 to 10 mL of a local anesthetic agent (in cattle) is deposited subcutaneously and relatively superficially midway between the lateral canthus of the eye and the base of the horn along the zygomatic process (Fig. 1). Complete anesthesia may take 10 minutes. Larger cattle with well-developed horns require additional anesthetic infiltration along the caudal aspect of the horn, in the form of a partial ring block, to desensitize subcutaneous branches of the second cervical nerve.<sup>2,5,6</sup>

Because of anatomical differences, the corneal nerve block in goats requires at least 2 injection sites per horn versus the aforementioned one site in cattle. In goats, the corneal nerve is a branch of the zygomaticotemporal nerve and lies halfway between the lateral canthus of the eye and the lateral base of the horn. The horn base in goats is also heavily innervated by the corneal branches of the infratrochlear nerve, which exits the orbit at or in close proximity to the medial canthus. Because of the widespread branching, the nerve is best blocked using a line block midway

Download English Version:

<https://daneshyari.com/en/article/5544427>

Download Persian Version:

<https://daneshyari.com/article/5544427>

[Daneshyari.com](https://daneshyari.com)