Ultrasound-Guided Paravertebral Regional Anesthesia in Water Buffalo

M.M. Shokry* and E.A. Berbish

Department of Surgery, Anesthesiology & Radiology, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt

Abstract: Adequate flank regional anaesthesia was achieved using ultrasound-guided nerve block of the 13th thoracic, 1st and 2nd lumbar spinal nerves after their exits from their intervertebral foraminae with only 5 ml of lidocaine 2%. Twelve successful trials were conducted on 4 buffaloes without any complications.

Keywords: Ultrasound, paravertebral, analgesia, spinal nerves.

INTRODUCTION

In the last recent decades, utilization of ultrasound (US) to guide needle placement during spatial nerve block is now well established in human patients [1-3].

By imaging nerves and other anatomic structures in real time with the aid of ultra-sonography, the dose of local anesthetic can be reduced and complications such as intravascular injection or intraneural administration can be avoided [4].

Paravertebral blocks are much more promising for ultrasound – guided techniques because of better visualization of the concerned nerves [5]. Ultra-sound guidance for nerve localization during peripheral nerve blockade has gained considerable popularity worldwide. Much of this popularity is attributable to several important advantages of real-time visualization compared with traditional landmark-based technique [3].

Paravertebral regional block (PRB) has been the anesthetic method of choice for surgical procedures as laparotomy, rumenotomy and caesarean section involving the flank region in buffaloes [6]. However, with reference to age and size, the difficulty to establish reliable landmarks of the target spinal nerves (13th thoracic, 1st and 2nd lumbar nerves) supplying the flank region, was the reason to conduct this study. Therefore the aim of this study is to provide accurate placement of the local anaesthetic over each spinal nerve by using ultrasound guidance in buffaloes.

*Address corresponding to this author at the Department of Surgery, Anesthesiology & Radiology, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt; Tel: +202/26907449; Fax: +202/35725240;

E-mail: shokry442002@gmail.com

MATERIALS AND METHODS

The previous anatomical study of the flank region in buffaloes by Said *et al.* [6] has been taken as a reference for ultrasound tracing of the paravertebral nerves supplying the flank region i.e. the 13th thoracic, 1st and 2nd lumbar spinal nerves at their exits from the intervertebral foraminae.

This study was conducted on 4 buffaloes (2 adults and 2 calves). On them, 12 ultrasound-guided paravertebral nerve block trials were performed. A 6 MHz Linear ultrasound probe (Toshiba, just vision 200) was used to image the previous paravertebral nerves. A 20-gg 12 ml spinal needle was also used in the procedure.

Because of the temperament of buffaloes, each buffalo was secured in a stanchion and sedated with 2% xylazine at a dose of i.m 0.1 mg/kg [7]. The sites of injection at the left flank region were clipped and disinfected by routine methods and coupling gel was distributed over the skin of the target area in which the concerned nerve trunks. Ultrasound images were presented as a single sagittal plane with slight posterior tilting using the landmarks originally described by Said *et al.* [6].

For the 13th thoracic nerve, in between the last thoracic and the 1st lumbar transverse processes, just behind the last rib and for the 1st and 2nd lumbar nerves, in between the succeeded lumbar transverse processes was, lateral to the midline. The spinal needle was then introduced in-plane with the US image over and close to the visualized particular nerve trunk and 5 ml of lidocaine 2% were injected in the vicinity of each nerve trunk (Figures **1** and **2**).

The left flank area was then assessed for analgesia by needle pricking and pinching with an artery forceps (Figure **3**).

ISSN: 1927-5196 / E-ISSN: 1927-520X/12

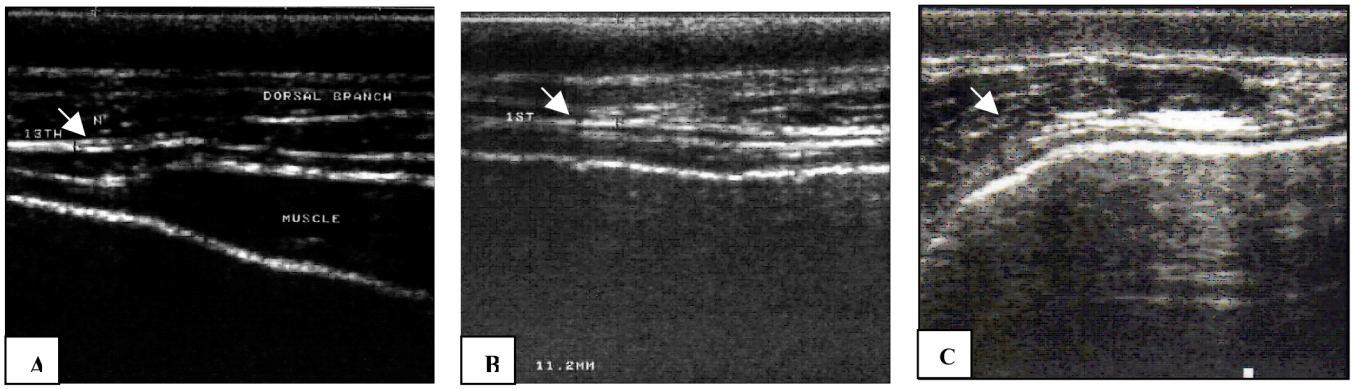

Figure 1: Ultrasonographic image of the 13th thoracic (**A**), the 1st lumbar (**B**) and the 2nd lumbar nerves with a linear probe (6 MHz) placed in a sagittal plane over the intertransverse lumbar proceses with slight posterior tilting.

Figure 2: The needles in the injection sites.

Figure 3: Assessment of flank analgesia.

RESULTS

Satisfactory anaesthesia of the left flank region was achieved within 2 minutes after injection and lasted for 120 minutes. Compared with landmark-based technique, using of ultrasound greatly improved the success rate of regional flank analgesia with minimal amounts of local anaesthetic. No complications were recorded with all trials.

The current results add another potential usefulness of ultrasound in the field of regional anaesthesia in animals.

DISCUSSION

Successful analgesia of the flank region in water buffalo was accomplished in all trials following US-guided paravertebral blocks. No complications were demonstrated. The technique was simple and accurate injection over and close to the visualized particular nerve trunk. The doses and concentration of the local anaesthetic (5 ml of 2% local anaesthetic) were very low in comparison with the doses and concentration used in routine blind injection (20 ml of 5% local anaesthetic) [6]. In this respect, US-guided nerve block is routinely used with great success in human patients [5, 8-10].

Recently, introduction of enhanced ultrasound needles are of great help to improve needle visibility during ultrasound-guided regional anaesthesia [11].

CONCLUSION

This study proves the safety and efficiency of ultrasound-guided flank regional anaesthesia in buffaloes by accurate delivering of small amounts of the local anaesthetic with a needle in close to the target spinal nerves (13th thoracic, 1st and 2nd lumbar).

REFERENCES

[1] Gray AT. Ultrasound guided. Anesth 2006; 104: 368-73. http://dx.doi.org/10.1097/00000542-200602000-00024

[2] Hamon D, Hearty C. Ultrasound-guided. Pain Physician 2007; 10: 743-46.

[3] Gorthi V, Moon JH, Kang JH. Ultrasonography-guided. Orthopedics 2010; 16: 238-41.

[4] Blanco R. Role of ultrasonography in neuroaxial and truncal technique. 30th annual congress of European Society of Regional Anaesthesia and Pain Therapy (ESRA), 2011.

[5] Hopkins P. Ultrasound guidance. Br J Anaesth 2007; 98: 299-301. http://dx.doi.org/10.1093/bja/ael387

[6] Said AH, Shokry MM, Fouad K. Paravertebral Anaesthesia Zbl Vet Med A 1976; 23: 85-8.

[7] Fouad K, Shokry M. Comparative Studies. Vet Med Rev 1973; 4: 332.

[8] Ribat J, Cuvillon P, Nouvellon E, Gaertner E, Eledjan JJ. Parasacral approach. Reg Anesth Pain Med 2005; 30: 193-7. http://dx.doi.org/10.1097/00115550-200503000-00010

[9] Sandhu NS, Capan LM. Ultrasound-guided Br J Anaeth 2002; 89: 254-9.

[10] Ben Ari AY, Joshi R, Uskova A, Chelly, E. Ultrasound localization. Anesth Analg 2009; 108: 1977-80.

[11] Hebard S, HockingG. Echogenic technology, Pain Med 2011; 36: 185-9.

Received on 01-01-2012 Accepted on 08-02-2012 Published on 15-03-2012

DOI: http//dx.doi.org/10.6000/1927-520X.2012.01.01.18