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Evaluation of tramadol as a rescue analgesic for corrective wedge osteotomies of antebrachial angular limb deformities in dogs using Glasgow composite measure pain scale score

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Abstract

The study was conducted to evaluate tramadol hydrochloride as a rescue analgesic in dogs corrected for antebrachial angular limb deformities by wedge osteotomies. A total of 18 dogs were corrected for antebrachial angular limb deformities using wedge osteotomies under general anaesthesia with isoflurane and oxygen. A numerical scale, Glasgow Composite Measure Pain Scale Score (Short form) system was used to assess the postoperative pain. The pain scores were taken after recovery from anaesthesia, 3rd, 7th and 14th postoperative day according to six behavioural indications of pain, including vocalisation, attention to the wound, mobility, response to touch, demeanour, and posture/activity. Postoperatively all the dogs were administered with tab. carprofen @ 2.2 mg/kg body weight orally with an interval of 12 hours. Tab. tramadol hydrochloride @ 3 mg/kg body weight was administered as a rescue analgesic when postoperative pain score was equal or greater than six. The results concluded that tramadol hydrochloride effectively controlled the post operative pain by 3rd postoperative day in all the dogs except in one case.

Keywords: Tramadol hydrochloride, rescue analgesic, wedge osteotomies, dogs, Glasgow composite measure pain scale score

Introduction

Pain is an unpleasant sensory and emotional experience that causes potential tissue injury (Wall, 1991) [8]. In addition to increased catabolism and metabolic rate, decreased gastro intestinal motility, tachycardia, respiratory depression, decreased food intake, and delayed wound healing, severe protracted pain following surgery is also linked to these issues. Acute pain also alters the central nervous system in an invisible way. Adequate intra operative and postoperative analgesia can minimize these negative consequences. As a result, the patient recovers quicker and can resume regular function sooner (Johnson, 1991) [4]. This study was aimed to evaluate tramadol hydrochloride as a postoperative rescue analgesic in dogs corrected for antebrachial angular limb deformities.

Materials and methods

A total of 18 dogs presented to the Small animal Orthopaedic outpatient unit with antebrachial angular limb deformities in dogs. These were planned for corrective osteotomies and randomly divided into two groups with nine dogs in each. Open and closed wedge osteotomies were performed in group I and II respectively. In both the groups they were given pre-emptive analgesia with inj. Meloxicam @ 0.2 mg/kg body weight intravenously one hour before the surgical procedure. Achieved general anaesthesia by inj. Butorphanol @ 0.2 mg/kg body weight and inj. diazepam @ 0.2 mg/kg body weight intravenously, induction with propofol @ 3 mg/kg body weight and maintenance with isoflurane with a vaporiser setting of 2-2.5% and oxygen. Postoperatively all the dogs received tab carprofen @ 2.2 mg/kg body weight orally with a 12 hour gap for seven days.

The Glasgow Composite Measure Pain Scale Score (Short form) system was used to assess the postoperative pain according to six behavioural indications of pain, including vocalisation, attention to the wound, mobility, response to touch, demeanour, and posture/activity. The total of the individual scores for each behavioural category as listed in the annexure was used to compute each dog's pain scores. For patients planned for corrective osteotomies, the pain score was assessed on immediately after from recovery anaesthesia, 3rd, 7th & 14th post operative days. When a dog's cumulative pain score reached six or more, tramadol hydrochloride @ 3

mg/kg body weight was given orally twice daily with an interval of 12 hours.

Results

All the dogs recovered from anaesthesia without any complications. In all the dogs, the pain score reached more than 6 on immediate observation from recovery of anaesthesia except for one dog of group II (case no.4) where the score

came to less than 6 by 7th postoperative day.

The pain scores measured over time intervals were differing from each other significantly ($p < 0.01$). The mean score for the pain observed using Friedman test were significantly higher immediately after recovery followed by 3rd day, 7th day, 14th day in both groups. The pain scores in both groups and statistical analysis were given table 1, 2 & 3.

Table 1: Glasgow pain score –post operative period in group I (open wedge osteotomy) dogs

Behavioural response	Post operative day	Case No. (Group-I)								
		1	2	3	4	5	6	7	8	9
Vocalisation	Immediate	1	1	1	1	1	1	1	1	1
	3	0	0	0	0	0	1	0	0	0
	7	0	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0	0
Attention to wound	Immediate	1	2	1	2	2	2	2	2	3
	3	1	0	1	0	0	1	0	1	1
	7	1	1	1	1	1	1	1	0	0
	14	1	0	0	1	0	0	0	0	0
Mobility	Immediate	1	1	1	1	1	1	1	1	1
	3	1	1	1	1	1	1	1	1	1
	7	1	1	1	1	1	1	1	1	1
	14	1	1	1	1	1	1	1	1	1
Response To touch	Immediate	3	2	1	1	1	2	2	1	1
	3	1	1	1	1	1	1	1	1	1
	7	0	0	0	1	0	1	1	1	1
	14	0	0	0	0	0	0	0	0	0
Demeanour	Immediate	1	1	1	1	1	1	1	1	1
	3	1	1	1	1	1	1	1	0	0
	7	0	0	0	0	0	0	0	0	0
	14	0	0	0	1	0	1	0	0	0
Posture	Immediate	2	2	2	2	2	2	2	2	2
	3	1	0	0	0	0	0	0	1	0
	7	0	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0	0
Total	Immediate	9	9	7	8	8	9	9	8	9
	3	5	3	4	3	3	5	3	4	3
	7	2	2	2	3	2	3	3	2	2
	14	2	1	1	3	1	2	1	1	1

Table 2: Glasgow pain score-post operative period in group II (closed wedge osteotomy) dogs

Behavioural response	Post operative Day	Case No. (Group-II)								
		1	2	3	4	5	6	7	8	9
Vocalisation	Immediate	1	1	1	1	1	1	1	1	1
	3	0	0	0	1	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0	0
Attention to wound	Immediate	2	1	3	1	2	1	1	2	2
	3	1	1	0	1	1	0	0	1	1
	7	0	1	0	0	0	0	1	0	0
	14	0	0	0	0	0	0	0	0	0
Mobility	Immediate	1	1	1	1	1	1	1	1	1
	3	1	1	1	1	1	1	1	1	1
	7	1	1	1	1	1	1	1	1	1
	14	1	0	0	0	0	0	0	0	1
Response To touch	Immediate	2	1	2	2	1	1	2	2	1
	3	1	0	1	2	0	0	1	1	1
	7	0	0	0	0	0	0	0	0	1
	14	0	0	0	0	0	0	0	0	0
Demeanour	Immediate	1	1	1	1	1	1	1	1	1
	3	1	1	1	1	1	1	1	1	1
	7	1	1	1	1	1	1	1	1	1
	14	0	0	0	0	0	0	0	1	0
Posture	Immediate	2	2	2	1	1	2	1	1	2
	3	0	0	0	1	0	0	1	0	1

	7	0	0	0	0	1	0	0	1	0
	14	0	0	0	0	0	0	0	0	0
Total	Immediate	9	7	10	7	7	7	7	8	8
	3	4	3	3	7	3	2	4	4	5
	7	2	3	2	2	3	2	3	3	3
	14	1	0	0	0	0	0	0	1	1

Table 3: Statistical analysis of pain assessment in group I & II (Friedman test), POD-postoperative day

Group	Chi-square	P value	Immediate	3 rd POD	7 th POD	14 th POD
Group I	25.393**	0.000	4.00 ^a	2.83 ^b	2.00 ^c	1.17 ^d
Group II	25.988**	0.000	3.94 ^a	2.89 ^b	2.17 ^c	1.00 ^d

Discussion

Tramadol is a moderately potent synthetic opioid. It acts through dual mechanism of action: binding to the opioid receptor type μ_1 and blocking the monoaminergic pathway, which is required for noradrenaline and serotonin reuptake (KuKanich and Papich 2004) [5]. Adverse effects like nausea and salivation were observed in dogs administered with tramadol hydrochloride @ 2 mg/kg body weight PO with an interval of 8 hours by Stanescu *et al.* (2013) [7]. No, such adverse effects were observed in the present study. The sedative effects of tramadol were related to the dogs' apparent calmer demeanour in both groups from 3rd postoperative day except in one case. Similar observations were made following the administration of tramadol by epidural (Guedes *et al.* 2005) [3], intravenous (McMillan *et al.* 2008; Giorgi *et al.* 2010) [6, 2], intramuscular (de Sousa *et al.* 2008; Giorgi *et al.* 2010) [1, 2] and oral (Stanescu *et al.* 2013) [7]. Scoring pain in animals, as in nonverbal humans, is a special challenge. Nevertheless it provides opportunities to place pain recognition and pain control in top of mind awareness, and thus has the promise of improving patient outcomes. The pain scale system used in this study helped in pain recognition and thereby managed effectively in dogs.

Conclusion

It was concluded that tramadol hydrochloride @ 3 mg/kg body weight along with carprofen @ 2.2 mg/kg body weight PO has effective in postoperative analgesia in dogs corrected for antebrachial angular limb deformities by wedge osteotomies.

References

- De Sousa AB, Dos Santos AD, Florio JC, Spinosa HS. Pharmacokinetics of tramadol administered by intravenous and intramuscular routes to female dogs submitted to ovariohysterectomy. *Brazilian Journal of Veterinary Research and Animal Science.* 2008;45(3):239-247.
- Giorgi M, Del Carlo S, Lebkowska-Wieruszewska B, Kowalski CJ, Saccomanni G. Pharmacokinetics of tramadol and metabolites after injective administrations in dogs. *Polish Journal of Veterinary Sciences.* 2010;13(4):639-644.
- Guedes AGP, Natalini CC, Robinson EP, Alves SDL, Oliveira SP. Epidural administration of tramadol as an analgesic technique in dogs submitted to stifle surgery. *The International Journal of Applied Research in Veterinary Medicine.* 2005;3(4):352-359.
- Johnson JM. The Veterinarians responsibility: assessing acute pain in dogs and cats part 1, *Compendium Continuing Educational Practice Veterinary.* 1991;13:804-807.

- KuKanich B, Papich MG. Pharmacokinetics of tramadol and the metabolite O-desmethyltramadol in dogs. *Journal of Veterinary Pharmacology and Therapeutics.* 2004;27(4):239-246.
- McMillan CJ, Livingston A, Clark CR, Dowling PM, Taylor SM, Duke T *et al.* Pharmacokinetics of intravenous tramadol in dogs. *Canadian Journal of Veterinary Research.* 2008;72(4):325-331.
- Stanescu M, Burac ME, Diaconescu AI, Togoe D, Vitalaru A, Birtoiu AI. Comparison of tramadol and robenacoxib postoperative analgesic efficacy in dogs. *Scientific Works. Series C. Veterinary Medicine.* 2011;59(1):72-75. ISSN 2065-1295
- Wall PD. Defining pain in animals. In: Short CE, Van Poznak A. eds, *Animal Pain.* 2nd ed. New York: Churchill-Livingstone Co; c1991. p. 63-79.

Annexure 1: Glasgow Composite Measure Pain Scale Score (Short Form)

Behavioural Category	Observable Response	Score
1. Vocalisation	Quiet	0
	Crying/whimpering	1
	Groaning	2
	Screaming	3
2. Attention to wound	Ignoring any wound/painful area	0
	Looking at wound	1
	Licking at wound	2
	Rubbing wound	3
3. Mobility	Chewing wound	4
	Normal	0
	Lame	1
	Show reluctance	2
4. Response to touch	Stiff	3
	Refuse to move	4
	Do nothing	0
	Look around	1
	Finch	2
	Growl/guard area	3
5. Demeanour	Snap	4
	Cry	5
	Happy and bouncy	0
	Quiet	1
	Indifferent/non responsive to surroundings	2
6. Posture	Nervous/anxious/fearful	3
	Depressed/non response to stimulation	4
	Comfortable	0
	Unsettled	1
	Restless	2
	Hunched/tense	3
	Rigid	4