



A Survey on Surgical Analgesia Practice in Dogs and Cats Among Veterinarians in Cluj-Napoca

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RESEARCH ARTICLE

Abstract

The present study aimed to assess attitudes, opinions and the methods used to treat surgical-induced pain among veterinarians practising in Cluj-Napoca. Thirty-six respondents were surveyed on a 31-item questionnaire that included demographic questions and two sections addressing pain control and analgesic use. Of all respondents, 52.8% consider their knowledge of pain recognition to be good (4/5); however, only 2.8% use pain-scoring tools. A small proportion of the respondents (16.7%) agree that cats are more resistant to pain than dogs, while 41.7% consider pain is good in some circumstances. For routine surgeries, the most popular opioid is butorphanol (62%), while tramadol was cited for major surgeries (58.3%). The most used NSAID is represented by meloxicam, while steroids are preferred over NSAIDs during major surgeries (60.1%). Overall, local veterinarians demonstrate a level of interest in pain control. However, excessive confidence in their personal experience to recognize pain often results in underestimation, under-medication and mismanagement of the patients in pain.

Keywords: analgesia, practice, online survey, cats, dogs

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INTRODUCTION

Freedom from pain is one of the five freedoms of animal welfare accepted as the standard of care followed worldwide (Farm Animal Welfare Council, 2009), and treatment is directly related to veterinarians' activity. Even though analgesic drugs are widely available, the pain remains a vital welfare issue as effective pain treatment requires solid knowledge and abilities to be recognized and measured reliably. Unfortunately, many professionals have been found to lack knowledge about providing excellent care, while they have individual attitudes and beliefs towards pain. Pain mainly occurs with surgical procedures but has been recognized due to trauma, medical conditions, infections and inflammatory diseases. If left unnoticed, it can cause a decrease in quality of life, prolonged recovery, and increased morbidity and mortality (Mathews et al. 2014). In the light of pain's impact on patients, veterinarian physicians need to be well prepared in its management. Factors relating to the medical profession, patients and available drugs have been identified as causes of pain under treatment in small animals. Specifically, oligo analgesia results as a consequence of failure to acknowledge the pain, inability to implement pain guidelines, inadequate training for analgesia modalities, restricted access to analgesic drugs, cost of medication and drug-induced side effects (Simon et al., 2017). Moreover, the lack of trained staff responsible for the quality of patient care, such as veterinary assistants and technicians, was identified as a predictive factor of poor analgesia in practices (Dohoo and Dohoo, 1996).

Extensive research shaped new philosophies in managing a patient in pain. Pharmacotherapy remains the mainstay of pain treatment; however, non-pharmacological approaches may also play essential roles in pain management (Alamrew and Fasseha, 2020). The choice of medication should be based on an adequate diagnosis and a thorough knowledge of the analgesic drugs' mechanism of action. Opioids, non-steroidal anti-inflammatory drugs (NSAIDs), loco-regional anaesthesia, and N-methyl D-aspartate receptor antagonists represent the main classes of analgesics used in veterinary patients, administered as single agents or in combinations of two or more agents (Grubb et al., 2020). An effective perioperative pain treatment incorporates drugs that act at different levels of the nociception phase, delivered during all four analgesia phases (preoperative, intraoperative, immediate postoperative and later postoperative) (Mathews et al. 2014).

Several studies evaluating the pain practice in veterinary patients have been published in different countries, proving to help identify factors that affect analgesia administration. Data about how anesthesia is performed in veterinary practices in Cluj-Napoca was published in 2017 (Pestean et al., 2016); however, no survey on the analgesia practiced by local veterinarians has been conducted until now. This research aims to gather data on how veterinarians address pain in their surgical patients, serving as a guide to further research and continuing education in this domain.

MATERIALS AND METHODS

The current questionnaire was developed as a preliminary study to assess attitudes, opinions and the methods used to treat surgical pain by veterinarians practising in Cluj-Napoca. The questionnaire, consisting of 3 sections and 31 closed-ended, multiple-choice questions, was built using a Google Form spreadsheet. The web link generated by the system containing the survey, together with a cover letter describing the aim of the study and the assurance that the responders would remain anonymous, was sent via email to 47 private veterinary practices. Thus, the survey was available from 15th June through 10th July 2021 and could be completed by veterinarians online, with their answers automatically stored as an Excel file.

The first part of the questionnaire collected demographic data from the veterinarians surveyed. The second part assessed the attitude of the veterinarians toward pain by asking the respondents to rank their knowledge regarding pain using a scale from 1 (very deficient) to 5 (excellent) and by providing participants with statements about self-perception on the importance of pain relief in cats and dogs, but also by questioning the satisfaction of veterinarians regarding the knowledge of the graduates in the field of veterinary analgesia. Finally, the third and central part focused on pain control. It contained questions on the extent of using different classes of analgesics according to the type of surgery (elective or major surgeries).

A simple descriptive analysis using Microsoft Excel 2016 was applied for each question where the percentage rate was calculated.

RESULTS AND DISCUSSIONS

In total, 36 veterinarians (one per surveyed practice) completed the questionnaire (response rate of 76.6 %), with an equal percentage of responses between female and male respondents. Three of the other 11 non-responder practices declined to participate, while the remaining eight did not offer feedback.

All veterinarians were graduates of the Faculty of Veterinary Medicine of Cluj-Napoca, the majority working in small animal practices (72.7%) with one (34.6%) or more (46.15%) employees and associates. Other types of employment included veterinary clinics (22.2%) and freelancers (2.8%). On average, female veterinarians graduated more recently than male veterinarians (2014 vs 2003). This finding is unsurprising, given that veterinary medicine has experienced a significant increase in the number of women studying in this domain. For example, in Cluj-Napoca, women constituted 71.5% of the student population in 2020, determining a gender shift in favour of women practitioners (Dean's report, 2020).

Regarding the level of education, most participants (83.3%) had attended postgraduate training courses in the field of veterinary analgesia.

Half of the respondents (52.8%) consider their ability to recognise and treat pain to be very good (4/5), 22.2% think it is excellent (5/5), 22.2% good (3/5), while 2.8% consider it very deficient (1/5). Of all respondents, only 1/36 (2.8%) use pain scoring tools to quantify pain in small animals. These results demonstrate that local veterinarians rely primarily on intuition and personal experience gained in practice to diagnose and quantify pain.

Recognising and assessing pain can often be challenging, and standardised methods should be used on a daily basis to increase veterinary patients' well-being. However, pain scoring systems can often be time-consuming and impractical, explaining their limited use in clinical practice (Downing, 2014). Moreover, successful integration of pain management into practice requires appropriate staffing. Dohoo and Dohoo (1996) observed that pain management increased proportionally with the number of veterinary technicians and their level of education. Similar, Weber et al. (2012) observed a proportional relationship between the use of NSAIDs and the number of employed health technicians. In the present survey, a little below half (41.7%) of the practices have employed one

(53.4%) or more (46.7%) veterinary assistants. Having limited human resources does not allow the clinician to allocate the time to assess a patient properly, leading to underdiagnosed and undertreated pain.

Despite deliberately withholding analgesics is considered unacceptable, a high proportion of the participants (41.7%) agree with the statement that pain is good for the animal as it restrains its activity and hurries the healing. Remarkably, gender was influential on our results, as 80% (12/15) of all those who agreed with this statement were male respondents. The authors of the present study attribute this gender difference in attitude toward pain to the respondents' graduation year, given that interest in pain management has increased in recent years (Capner et al., 1996). Therefore, recent graduates have a different perception of pain than older graduates.

Sixty-six per cent of the questioned veterinarians disagreed that pain is more challenging to recognise in cats, while 16.7% considered that feline patients are more resistant to pain than canines. As was proved in previous studies on the same subject, this general opinion leads to significant differences in the frequency and type of analgesics used between species. For example, elective procedures like ovariohysterectomy in Finnish veterinary practices were treated more often in canine patients than in felines (Raekallio et al., 2003). Similarly, Morales-Valencilla et al. (2019) demonstrated that Colombian veterinarians expressed more confidence in treating pain in dogs than in cats. By comparison, French veterinarians believe that pain perception is comparable between these two species (Hugonard et al., 2004).

When asked about the primary sources of their knowledge on pain management, most participants voted for seminars and conferences (72.2%), followed by personal experience (61.1%), communication with colleagues (55.6%), scientific books (52.8%) and articles (47.2%), and other online resources (50%). In contrast to our results, Italian practitioners listed scientific papers as the primary sources about this subject, followed by continuing education and university studies (Catanzaro et al., 2016). Relying more on personal experience and communication with colleagues than professional articles might question veterinarians' judgement on pain management as these sources are not always evidence-based for their decision-making process.

Over half of the responders (55.6%) shared that the knowledge of the new graduates is adequate, which contrasts with the Colombian and Slovenian veterinarians' beliefs that undergraduates are inadequately taught to identify and treat an animal in pain (Morales-Valencilla et al., 2019; Tomsic et al., 2021).

In agreement with earlier studies (Hugonard et al., 2000; Williams et al., 2005; Catanzaro et al., 2016), the vast majority (94.4%) of the questioned veterinarians shared their interest in attending further training in the field of small animal analgesia, to improve their knowledge. Opioid drugs appeared commonly used for pain relief in small animal practices. In particular, butorphanol, a short-acting agonist-antagonist opioid, is the most frequently used opioid during convenience surgery (80.55%), similar to other reports (Reimann et al., 2017; Tomsic et al., 2021) (Table 1).

Table 1. Analgesic drugs administered by local veterinarians (%) in case of elective and major surgery

| Analgesic drugs | Elective surgery | Major surgery |
|---------------------------------|------------------|---------------|
| Nonsteroidal drugs | 27 (75%) | 9 (25%) |
| Meloxicam | 34 (94.4%) | 2 (5.6%) |
| Carprofen | 11 (30.6%) | 15 (41.7%) |
| Ketoprofen | 4 (11.2%) | 18 (50%) |
| Firocoxib | 3 (8.33%) | 12 (33.3%) |
| Robenacoxib | 7 (19.4%) | 10 (27.8%) |
| Cimicoxib | 1 (2.8%) | 9 (25%) |
| Grapiprant | - | 3 (8.33%) |
| Paracetamol | 2 (5.6%) | 17 (47.2%) |
| Metamizole | 28 (77.8%) | 2 (5.5%) |
| Steroidal drugs | 9 (25%) | (38.9%) |
| Opioids | 11 (30.6%) | 18 (50%) |
| Morphine | 8 (22.2%) | 13 (36.1%) |
| Pethidine | 1 (2.8%) | 14 (38.9%) |
| Fentanyl | 3 (8.33%) | 17 (47.2%) |
| Butorphanol | 29 (80.6%) | 4 (11.1%) |
| Tramadol | 6 (16.7%) | 21 (58.3%) |
| (Dex)Medetomidine | 10 (27.8%) | 23 (63.9%) |
| Ketamine | 16 (44.4%) | 19 (52.9%) |
| Locoregional anaesthesia | | |
| Infiltration anaesthesia | 30 (83.3%) | 6 (16.7%) |
| Plexus block | 3 (8.33%) | 22 (61.1%) |
| Epidural/subdural anaesthesia | 3 (8.33%) | 5 (13.9%) |

The second most administered opioid is represented by morphine (22.2%), followed by tramadol (16.7%), fentanyl (8.33%) and pethidine (2.8%). For major surgeries, tramadol, a synthetic opioid with controversies regarding its analgesic effect in small animals, is listed as the most frequently used opioid (58.3%), followed by fentanyl (47.2%), pethidine (38.8%) and morphine (36.1%), while the least most used is butorphanol (11.1%). Like other countries, in Romania, tramadol usage does not require record-keeping as it is not a controlled drug, making it readily available for most practitioners. However, studies have proved that tramadol is a weak analgesic and should be used as part of multimodal analgesia (Bradbrook and Clark, 2018) (Table 1).

Among the other analgesics, alpha2 adrenoceptor agonists, particularly (dex)medetomidine, are constantly used by 63.9% of the respondents in cases of major surgeries. Alpha2 agonists are widely used for short sedation for non-invasive procedures and as part of neuroleptanalgesia or multimodal analgesia. They are classified as analgesic adjuvants and benefit from supplementing analgesia while reducing stress. However, these drugs should not be used as 'standalone' analgesics in animals with systemic diseases, mainly due to their profound cardiovascular effects (Murrell and Hellebrekers, 2005).

Mainly used as a component of general anaesthesia, ketamine is selected as a significant analgesic for both convenience (44.4%) and major surgeries (52.7%). Again, these percentages are greater than those Huggonard et al. (2004) reported.

Compared to bolus administration of drugs, infusions have the advantage of continuously delivering low doses of various analgesics while eliminating the peak effects observed with intermittent boluses. Many agents are delivered this way in veterinary medicine, but the most frequently used drugs are represented by opioids, local anaesthetics and N-Methyl-D-aspartate antagonists (Zoff and Bradbrook, 2016). According to our study, half of the respondents use constant rate infusions of one or more analgesics. Among the drugs listed, lidocaine is most commonly administered during convenience surgeries (31%), followed by butorphanol (25%), (dex)medetomidine (13%), ketamine (13%), morphine (13%) and fentanyl (6%). As for major surgeries, the respondents prefer infusions of (dex)medetomidine (24%) and ketamine (24%), followed by fentanyl (22%), morphine (14%), butorphanol (11%), while the last one is lidocaine (5%). Lidocaine is mainly used as a local anaesthetic, but when administered intravenously, it is considered to have pro-kinetic, antiarrhythmic, inhalant-anaesthetic sparing and anti-inflammatory action (WSAVA 2014). In dog patients, Valverde et al. (2004) showed that lidocaine decreases the isoflurane requirements by 18.7%, whereas 22.7% was obtained by Gutierrez-Blanco (2013). Moreover, Ortega and Cruz (2011) found that administration of lidocaine infusion reduces the pain response to surgical stimulation in clinically healthy patients; however, Colombano et al. (2012) concluded that the addition of lidocaine to an opioid-based anaesthesia protocol does not have any sparing effect on inhalant drugs, neither does improve analgesia for the same surgical procedure. Ketamine is a dissociative anaesthetic and acts as a non-competitive antagonist at N-methyl-D-aspartate (NMDA) receptors in the spinal cord, reducing the transmission of the nociceptive signals from the periphery toward the central nervous system following surgical tissue injuries. In small animals, evidence suggests that infusions of ketamine benefit from augmenting intraoperative and postoperative analgesia and reducing the inhalant needed for anaesthesia (Wagner et al., 2002; Pascoe et al., 2007; Gianotti et al., 2014). Pure opioid agonists offer excellent analgesia for a short duration (e.g., fentanyl, morphine); therefore, CRIs of such molecules are needed to prevent lapses in analgesia and reduce side effects associated with higher doses required for bolus administration (Zoff and Bradbrook, 2016). According to our respondents, butorphanol is seldom used as a constant rate infusion in small animals. Previous papers mention that equine patients might benefit from better and longer analgesia with inputs of butorphanol (Sellon et al., 2004; Sanz et al., 2009); however, limited data is available on this subject in dogs and cats. Regarding the equipment used for intravenous administration of analgesics, 69% of veterinarians use infusion pumps for convenience and major surgeries, and 67% use syringe pumps. Taken separately, the syringe pump is most preferred to be used in major surgeries (42%), while infusion pumps in convenience surgery (41%). In contrast, the least used equipment remains the perfusion set, with a proportion of 39% of the veterinarians using it.

All questioned veterinarians use infiltration anaesthesia, 83.3% during elective surgeries, while only 12.1% during major surgeries. Plexus block anaesthesia is regularly performed by 69.4% of veterinarians, with higher frequency during major interventions (61.3%); epidural anaesthesia is performed by 22.2% of the practitioners. In contrast, no veterinarian in the Weber et al. (2012) study reported using loco-regional anaesthesia techniques in canine ovariohysterectomy. Similarly, French practitioners seldom use local anaesthesia (Huggonard et al., 2004), while only 45% of Colombian veterinarians regularly use these techniques for peri/intraoperative analgesia (Morrales-Valencilla et al., 2019). No respondent reported using specific equipment such as the ultrasound machine or nerve stimulator to perform regional anaesthesia.

In the postoperative period, nonsteroidal anti-inflammatory drugs are the most popular drugs the questioned veterinarians use; 75% of the respondents rely on these molecules' effects for elective surgeries. For major cases, 50% of veterinarians prefer opioids for postoperative analgesia, while 2.8% use alternative technics. Although corticosteroids are no longer considered primary analgesic substances, 63.9% of the questioned veterinarians still use this class of drugs to treat postoperative pain. Moreover, in more than half of the cases (60.1%), corticosteroids

are administered after major surgeries. This finding is regrettable and highly suggestive of poor analgesia management in small animals.

Multimodal analgesia combines two or more analgesic substances from different pharmacological classes to reduce pain. This technique allows the intervention to varying levels of nociceptive transmission, increasing the effectiveness and eliminating the need to use high and prolonged doses of drugs (Grubb et al., 2020). In our study, 66.7% of the surveyed veterinarians use multimodal analgesia, with higher frequency in conjunction with major interventions (~83.3%). This proportion is similar to the one reported by Morales-Valencilla et al. (2019). However, the validity of this proportion is questionable, as it is unclear if the respondents are familiar with the term 'multimodal analgesia'.

During elective surgeries, meloxicam and metamizole are the most commonly used NSAIDs used by 94.4%, respectively, 77.8% of the questioned veterinarians, followed by carprofen, respectively, robenacoxib and ketoprofen (30.6%, 19.4%, 11.2%). However, in major surgeries, the most constantly prescribed drug is represented by ketoprofen (50%), followed by paracetamol (47.2%), carprofen (4.2%), while meloxicam and metamizole are the least frequently used (5.5%). In Slovenia, meloxicam and carprofen are the most used NSAIDs in cats and dogs for all types of surgeries (Tomsič et al., 2021), while in Colombia, the choices were comparable with our study (Morales-Valencilla et al., 2019). When asked about the main factor that influences their use of a specific NSAID, most respondents indicated the renal side effects (63.8%), followed by antipyretic effect (58.3%), hepatic (58.3%) and gastrointestinal (58.5%) side effects, anticoagulant effect (52.7%) and accessibility (16.6%). In contrast, the least important factors were the analgesic effect (11.1%) and price (5.5%). As regards convenience surgeries, the primary criteria were the analgesic effect (77.7%), followed by price (61.1%) and accessibility (55.5%). Again, these results might put under question the quality of analgesia provided by the veterinarians during convenience surgeries in Cluj-Napoca, given that the economic aspect is still a matter of concern between veterinarians, together with accessibility. By comparison, in Slovenia, the price was listed as the least important factor (Tomsič et al., 2021), but not for Colombian veterinarians, where many drugs are cost-prohibited (Morales-Valencilla et al., 2019).

Finally, a little below half of the respondents declared unsatisfied when asked if they are satisfied with the analgesic diversity that veterinarians have access to. The authors of the present study associate this high proportion with the fact that, at the time the survey was performed, pure agonist opioids were more difficult to be acquired in Romania.

CONCLUSIONS

This study reflects the attitude and the analgesia practice of a small sample of veterinarians in Cluj-Napoca. Overall, local veterinarians demonstrate an interest in providing analgesia to their patients; however, substantial improvements should be made in pain assessment and management, as excessive confidence in their personal experience to recognise pain can result in underestimation and under-medication of the animal in pain. This problem can be overcome through pain management training and strengthening didactic and clinical learning in undergraduate educational programs, respectively.

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