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RESEARCH PAPER

Agreement between veterinary students and anesthesiologists regarding postoperative pain assessment in dogs

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Abstract

Objective To determine the levels of agreement among first- and second-year veterinary students and experienced anesthesiologists in assessing postoperative pain in dogs from video-recordings.

Study design Cross-sectional study.

Subjects Twenty-seven veterinary students, five anesthesiologists and 13 canine clinical patients.

Methods Prior to their enrolment in a core anesthesia course, veterinary students volunteered to watch 13 90 second videos of dogs. Dogs were hospitalized in an intensive care unit after a variety of surgical procedures. Students were asked to score the level of the dogs' pain using the Dynamic Interactive Visual Analog Scale and the Short Form of the Glasgow Composite-Measure Pain Scale. The same videotapes were scored by five board-certified anesthesiologists. The differences and agreement between the ratings of anesthesiologists and students, and first- and second-year students were determined with Mann–Whitney *U*-tests and Fleiss' or Cohen's kappa, respectively.

Results Pain scores assigned by students and anesthesiologists differed significantly ($p < 0.01$). Students assigned higher pain scores to dogs that were given low pain scores by anesthesiologists, and lower pain scores to dogs deemed to be in more pain by anesthesiologists. On average, students assigned higher scores on both scales.

Conclusions and clinical relevance Veterinary students early in their training assigned pain scores to dogs that differed from scores assigned by experienced anesthesiologists.

Keywords dog, pain assessment, pain scale, veterinary student, video.

Introduction

The intensity of pain experienced by a patient is determined by a number of factors, some of which include the type of pain (acute or chronic), the cause of the pain, the body's current physical condition and the imposition of factors such as stress (Anil et al. 2002). This variability presents a challenge in the development of a pain scoring system and may represent an obstacle to novice pain evaluators.

The ability to reliably evaluate pain in animals is important to veterinarians in terms of their capacity to successfully treat painful conditions, which may either temporarily or permanently affect an animal's welfare. However, no standard method to accurately and consistently measure pain has been developed. Various parameters, such as animal behavior or physiologic parameters, are used to judge an animal's level of discomfort and anxiety (Rialland et al.

2012) and tools and questionnaires have been designed to assess the intensity and source of pain. Several scales have been developed to assess pain in veterinary medicine, such as the Visual Analog Scale (VAS) (Mbugua et al. 1988; Reid & Nolan 1991) or Dynamic Interactive Visual Analog Scale (DIVAS) (Lascelles et al. 1998) and the Short Form of the Glasgow Composite-Measure Pain Scale (GCMPS) (Reid et al. 2007).

The VAS is used in people in self-reported levels of pain and has been adapted for pain assessment in veterinary patients (Holton et al. 1998). Some authors have used the term 'VAS' in place of 'DIVAS', even if the assessment involved interaction with the animal (Lascelles et al. 1994; O & Smith 2013). The difference between the two scales lies in how the score is assigned. In the VAS, the score is based only on observation of the animal, whereas in the DIVAS the animal is first observed from a distance and then approached and encouraged to walk. Before a final assessment is made with the DIVAS, the surgical incision and the surrounding area are palpated (Lascelles et al. 1998; Hellyer et al. 2007). Although the DIVAS, like other pain scales, is subjective and has been deemed unreliable by some authors (Holton et al. 1998; Morton et al. 2005), it has been and still is widely used in veterinary medicine to assess pain (Lascelles et al. 1994; O & Smith 2013; Rhouma et al. 2013; Teixeira et al. 2013). Various factors influence the validity and reliability of the DIVAS, including the age and experience of the observer, his or her visual acuity, the use of gradation marks on the line, line orientation (vertical *versus* horizontal), and the level of the patient's sedation (Dixon & Bird 1981; Sriwatanakul et al. 1983; Stephenson & Herman 2000; Plant 2007; Rialland et al. 2012). In a recent study, the authors showed moderate agreement between the DIVAS and GCMPS in dogs hospitalized for a variety of procedures (Moran & Hofmeister 2013). The main advantages of the DIVAS include a high degree of sensitivity arising from the continuous nature of the scale, a direct linear relationship between mild and moderate pain, and its simplicity (Myles et al. 1999; Morton et al. 2005).

The GCMPS is a questionnaire-based scaling system, modeled after the McGill Pain Questionnaire developed by Melzack & Torgerson (1971). Compared with the DIVAS, the GCMPS is a multidimensional scale. The DIVAS measures only one dimension of the pain experience, namely, its intensity, whereas the GCMPS and other multidimensional or composite rating scales also take into account the sensory and affective qualities of pain (Murrell et al. 2008). The GCMPS has shown good inter-observer correlation in post-procedural pain assessment (Guillot et al. 2011), but may be biased by sedation (Murrell et al. 2008; Guillot et al. 2011). Although the GCMPS has proven to be useful for measuring acute pain in dogs (Morton et al. 2005; Murrell et al. 2008), it may be less intuitive than the DIVAS for inexperienced evaluators.

The need for training in pain assessment is well documented in human medicine (Yanni et al. 2009; Murinson et al. 2011; Keefe & Wharrad 2012). Only a few studies have investigated this topic in veterinary medicine (Turnwald et al. 2008; Kerr et al. 2013). Computer-aided learning tools may improve the ability of veterinary students to assess animal welfare (Kerr et al. 2013).

The purpose of this study was to determine whether first- and second-year students would evaluate pain in dogs similarly to experienced anesthesiologists. The hypothesis was that students without any training in pain assessment would score postoperative pain in dogs similarly to experienced anesthesiologists.

Materials and methods

This study was approved by the University of Georgia Institutional Review Board for Human Subjects. After their owners' written consent had been obtained, 13 dogs were videotaped once each in the intensive care unit (ICU) at the University of Georgia Veterinary Teaching Hospital over a 2-week period. The dogs had undergone a variety of surgical procedures including exploratory laparotomy ($n = 6$), hemilaminectomy ($n = 3$), tibial-plateau-leveling osteotomy ($n = 2$), bilateral fragmented coronoid process removal ($n = 1$), and ventral stabilization of atlanto-axial subluxation ($n = 1$). After full recovery from general anesthesia, each dog was videotaped for approximately 90 seconds (Nikon Coolpix S203; Nikon, Inc., NY, USA), while an evaluator interacted with the dog. The person interacting with the dog was always the same person and the animal was required to be awake and to have recovered from anesthesia before the interaction. Analgesic drugs were not withheld for the purpose of this study and were administered based on the standard of care at the University of Georgia Veterinary Teaching Hospital. During the interaction, the dog was first approached and spoken

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