Assessment of pain in cats

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Introduction

Recognition and assessment of pain is important in animal welfare as untreated pain can cause harm through catabolism, delayed healing, impaired respiration and increased morbidity (Cambridge *et al*., 2000). Assessment of pain in cats is complicated and can be difficult to recognise because behavioural manifestations are frequently subtle or non-existent (Wright, 2002). The difficulty in assessing pain in cats reflects the need to recognize and summate complex and subtle behaviours that provide an objective measurement of pain (Burrow *et al*., 2006). It is also important in emergency care to have a sensitive and reliable pain-scoring system that is quick and simple to use (Robertson, 2005).

Discussion

Recent studies on pain in cats have focused on using behavioural responses such as postural changes, depression, hiding, growling, hissing, licking, chewing, biting, flinching or self-mutilation as indicators. Grint *et al*. (2006) attempted to assess the influence of surgical approach (midline incision verses flank incision) on pain level in 66 cats following ovariohysterectomy (OHE). A visual analogue scale (VAS) with a physical interaction component was used to compare severity of postoperative pain (Grint *et al*., 2006). A VAS requires an observer to place a mark on a 100mm scale at the point they feel best describes the level of pain being experienced, with 0 being 'no pain' and 100 being 'worst possible pain' (Cambridge *et al*., 2000). The use of physical interaction, such as palpating around a wound, has been shown to improve the sensitivity of a VAS (Robertson, 2005; Cambridge *et al*., 2000). In the study by Grint *et al*. (2006), a VAS score was assessed before surgery. Two possible surgery sites were palpated and scored. The assessment was repeated periodically after surgery. They found that a VAS for pain was unable to detect significant differences in the surgical method used. However, a VAS for wound tenderness indicated a significant increase in tenderness from the flank approach. The authors surmised that mere observation may be insufficient to assess pain adequately and palpation should also be used to give a more accurate pain score.

A limitation of the behavioural scores is the subjective interpretation by the observer. The nature of the VAS means it is more susceptible to observer differences, as they are asked what pain they believe the animal is experiencing. Anil *et al*. (2002) state that the VAS score is considered more sensitive than other systems as it does not use defined categories. It is possible the VAS scores were unable to accurately reflect differences in pain levels because the sample size was small or observers were significantly biased (as the trial was not blinded). Blinding a surgical trial is difficult in cats as bandages or wrappings can influence a cat's behaviour (Grint *et al*., 2006). However, this is an area for further study.

Behavioural responses can also be assessed using a simple descriptive scale (SDS). Here, an observer applies values to many described behaviours and summation of the scores provides the total pain score (Cambridge *et al*., 2000). Burrow *et al*. (2006) used an SDS in conjunction with a VAS to evaluate surgical techniques and postoperative pain following OHE. Twenty cats underwent OHE by a midline or flank approach and multiple assessments of post-operative pain were made. Baseline values were collected before surgery with all assessments being made by the same assessor (who, again, was not blinded to the treatment). This study found that cats subjected to the flank approach had higher pain scores, although the differences were not significant. This is probably because the cohort was too small to detect statistically significant differences. The study noted the importance of obtaining baseline information due to the effects of socialisation and environmental factors on a cat's response to an observer. Some cats had a lower score 24 hours after surgery than their baseline score, which serves to illustrate the

difficulty in separating behavioural and physiological responses (Burrow *et al*., 2006). The authors identified inconsistent pressure on palpation as a possible variable affecting results. Various devices have been developed to overcome this problem and these could be used in future studies (Burrow *et al*., 2006).

Plasma cortisol concentrations are measured as an indicator for pain in many species (Anil *et al*., 2002). A recent study comparing the efficacy of four types of analgesia in 52 cats following OHE used cortisol concentrations and a VAS and interactive VAS (IVAS) score to determine levels of postoperative pain (Tobias *et al*., 2006). Cats were given butorphanol, ketoprofen, carprofen or bupivicaine infiltration block before surgery and cortisol and drug concentrations and VAS and IVAS behaviour scores were measured before and at various times after surgery (Tobias *et al*., 2006). Significant differences in cortisol concentrations were seen only in cats receiving carprofen, which were higher one hour after surgery than baseline, and lower at 24 hours after surgery. Differences in cortisol concentrations in other groups and at other times were not statistically significant. In an earlier study, investigating analgesic efficacy of fentanyl patches, cortisol concentrations were shown to decrease with application of pain relief (Glerum *et al*., 2001). Biochemical markers, such as cortisol concentration, can be altered by stress and other factors more readily in cats than other species, thus decreasing its usefulness as an indicator for pain (Robertson, 2005; Carroll, 2007).

In the Tobias *et al*. (2006) study, VAS and IVAS scores were also measured and significant differences in pain levels between times and treatments were detected using these scales. Again, this study was also limited by small sample size and observer subjectivity. Further studies using cortisol and behaviour responses with larger sample groups and tightly controlled experimental conditions may clarify correlations between these two parameters.

Conclusion

Observation of behavioural responses is important in assessing pain in cats. However, as they are stoic animals, observation is liable to miss subtle signs or perhaps mistake these for stress-related behaviours. Recent studies using interactive behaviour scores may provide a more reliable method of assessing pain and are likely to be more useful in clinical practice than biochemical markers.

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