Multimodal Management of Feline Arthritis

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ABSTRACT

Arthritis in cats has only recently been recognized as a widespread clinical disease. Several recent studies suggest that recognizing behavioral and lifestyle changes may be the most sensitive method of diagnosing impaired mobility in cats. Recognizing altered behavior requires an understanding of normal feline behavior. Once diagnosed, therapies for arthritis in cats include NSAIDs, chondroprotectants, nutraceuticals, physical rehabilitation and therapeutic foods. To date, there are published studies documenting efficacy for NSAIDs and therapeutic foods in cats with naturally occurring disease.

DIAGNOSIS

It is essential that veterinarians educate cat owners in the recognition and management of pain in their cats.¹ Since cats in the wild can be both predator and prey, most cats have a remarkable ability to hide signs of illness. Therefore, any change from normal behavior must be considered as a possible sign of pain, discomfort or disease. To maintain the optimal health and welfare of our feline patients, veterinarians and their staff must be proactive in inquiring about any changes in behavior at every veterinary visit. Since the presence of behavioral signs can be indicative of a wide range of medical problems including pain, early identification and diagnosis is essential to the pets health and welfare. In addition, early intervention to manage or improve both pain and illness serves the cat's interest and also helps to strengthen the human-animal bond by improving social interactions and behavior.

With respect to degenerative joint disease (DJD), a thorough orthopedic exam should be performed on all cats suspected of having arthritis; however, owner observations of activity and behavior have been shown to be a more sensitive indicator of impaired mobility and response to therapy.²⁻⁵ In fact, numerous studies have found that radiographic osteoarthritis is not necessarily associated with pain in cats.^{2,3,6} In one study, 90% of cats older than 12 years had radiographic evidence of degenerative joint disease while only 4% had altered mobility or lameness.⁶ Conversely, joints that appear to be painful on palpation may be radiographically normal.^{2,3} A recent study suggests that about a third of cats will have radiographic changes without clinical signs of pain, a third will have clinical signs of pain without radiographic changes and a third will have both² (Figure 1).



Figure 1. Radiographic changes and clinical signs of pain are not always concurrently present in cats with degenerative joint disease.

Studies have consistently shown that owner assessment of changes in their cats' behavior is important for identifying pain.^{1,3-5} However, owners need to be educated on how to assess their cat's mobility. Unlike dogs, cats with arthritis rarely present with overt lameness.³ Activities such as willingness to jump (up or down), height of jump, general movement, 'grumpiness' on handling and seeking seclusion are more commonly observed in affected cats³ (Figure 2).

Mobility	inability to jump as highreluctance to jumpchanges in toileting
Activity	 changes in sleep patterns decreased play/hunting
Grooming	decreased groomingdecreased scratching
Temperament	 avoids contact with owner or other pets hiding

Figure 2. Clinical signs of altered mobility in cats can be divided into four general categories.⁴



🕨 Play Video

This cat refused to jump down from the examination table. It would jump down from the exam table to a chair and then to the floor. Note also the "ungainly" landing on the chair and floor. This cat was found to have elbow DJD, as well as stifle and hip DJD. Video courtesy of Dr. Duncan Lascelles.

Willingness to jump can be assessed in the exam room as demonstrated in this video.

A recent study used an accelerometer as an objective measure to document that owners can detect when their cats are more or less mobile.⁵ In this study owners were allowed to select the specific activities they felt were impaired in their cat. Of those they picked, the following showed improvement when cats were administered an NSAID; jumping (up/down), playing (toys/cats), running (to food/ from dog), lying down, moving up stairs, walking, sharpening claws, grooming, using litter tray and hunting.

In order to identify pain, owners should consider what is normal behavior for their cat. Pain might lead to an alteration in demeanor, decreased activity, hiding, altered sleep habits, less play, a decrease in scratching or stretching behavior, or increased avoidance of, or aggression to humans or other pets.^{2,3,4} Vocalization, resentment or even aggression may be seen when the cat is stroked, brushed or handled in an area of the body that is painful.² Also be aware of changes in coping strategies to deal with pain such as where and how the cat climbs, perches or jumps, or the cat's posture and body position when sitting or lying down. Pain can also lead to litter box avoidance and housesoiling if it becomes uncomfortable to access the litter box or to get into a comfortable position to eliminate.⁴ A decrease in activity, climbing and play, decreased grooming and scratching, altered sleep and appetite, and decreased interest in social interactions can have further detrimental effects on mental and physical health.

Since standardized and validated pain assessment scoring for cats is lacking, and with the wide individual variability in how cats express pain, the diagnosis should focus on identifying any change from normal behavior and any alterations in mobility combined with an orthopedic examination including radiographs where indicated. A therapeutic response trial can then be implemented to determine if there is any measurable improvement in mobility and for improvement or "normalization" of behavioral signs.

Diagnosing arthritis in cats can be challenging.

Identify changes in mobility and normal behavior.

Therapy is aimed at improving mobility and "normalizing" behavior.



BEHAVIORAL THERAPY

Reduction and control of pain should improve or resolve most of the behavioral signs. In fact, monitoring for behavioral improvement is an important means of confirming the diagnosis and determining response to therapy. Attention to environmental enrichment can serve to encourage increased mobility and physical activity, which may be beneficial in the rehabilitation process, may increase calorie expenditure where weight control is an issue, and can reduce stress and maintain mental stimulation. Play toys, interactive play sessions and climbing activities should be tailored to optimize physical fitness while working within the limitations of the pet. Hiding, perching and resting places may need to be altered to allow for any limitations in mobility. For details on environmental enrichment see proceedings notes on Multimodal Management of Obesity and Multimodal Therapy for Cats with Idiopathic Cystitis.

Even with effective pain control, some behavior problems may persist. This may be the case when a pet has begun to eliminate outside the litter box and new location and surface preferences develop, especially when medical problems cannot be entirely resolved. Providing more litter boxes in more readily accessible locations, and modifications to the litter or the box, may also be necessary to encourage use. More details on litter box management can be found in the proceedings for Multimodal Therapy for Cats with Idiopathic Cystitis. In cases where pain has led to alterations in social relationships with people or other pets, pain management may not necessarily result in the resolution of behavioral signs. When fear and anxiety persist, behavior therapy will also be needed to gradually reestablish a positive association with the person, action or situation (desensitization and counterconditioning) and anxiolytic medication or supplements might also be a consideration.

MEDICAL THERAPY

Management of arthritis in dogs is dominated by the use of NSAIDs. There are numerous products approved for the management of acute and chronic pain in dogs. Not so in cats. The paucity of licensed NSAIDs for cats may relate to challenges assessing pain and increased risks of toxicity.⁶ NSAIDs should be used with caution in cats because of their low capacity for hepatic glucuronidation, the primary mechanism of metabolism and excretion for this class of drugs. A recent review documents the available evidence supporting the safety and efficacy of NSAIDs in cats.⁶ Therapeutic foods can be defined as any food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains. The introduction of iodine to Morton[®] Salt in 1924 was instrumental in eradicating goiter from the U.S. population. It was also the birth of 'functional foods'; the first time a food company purposely added a medically beneficial ingredient to a food. In recent years there has been renewed interest in therapeutic foods both in human and veterinary medicine.



NSAIDS

There are no NSAIDs labeled for long-term use in cats in the U.S. Tolfenamic acid and ketoprofen are labeled for up to five days' use, and carprofen and meloxicam are labeled for preoperative use in some countries. However, in practice, many cats have benefited from NSAID therapy for months to years. Six recent studies demonstrate the safety and efficacy of three NSAIDs (meloxicam, ketoprofen and robenacoxib) for the management of acute and chronic mobility impairment in cats.^{3-5,7-9} However, it is important to note that in a review of reported adverse drug events in the U.S., the FDA identified many cases of kidney failure and death in cats associated with repeated use of Metacam[®]. As a result of this review, the FDA asked the manufacturer to add the following warning to the product label.

Warning: Repeated use of meloxicam in cats has been associated with acute renal failure and death. Do not administer additional doses of injectable or oral meloxicam to cats. See Contraindications, Warnings and Precautions for detailed information.

This warning does not affect the approved indications for a single use of Metacam Solution for injection in cats for the control of postoperative pain and inflammation associated with orthopedic surgery, ovariohysterectomy and castration when administered prior to surgery. Indications for acute and chronic use in dogs remain unchanged.

The use of meloxicam in cats with mobility impairment has been evaluated in five studies ranging from 5 days to 5.8 months duration.^{3-5,7,8} In all of these studies both owners and veterinarians were able to detect significant changes in mobility/activity after treatment. One study used activity monitors to objectively document increased activity.⁵ The doses cats received in these studies ranged from 0.01-0.03 mg/kg orally once daily for 1 to 6 months to 0.05 -0.1 mg/kg orally once daily for 5 days. Side effects were uncommon and included vomiting, diarrhea and decreased appetite. Based on these studies the recommended dose for chronic administration of meloxicam is 0.1 mg/ kg PO or SC on day 1, followed by 0.05 mg/ kg for 1–4 days; then reduce rapidly to the lowest effective dose (0.025 mg/ kg every 24 or 48 hours) monitoring closely for side effects. Robenacoxib has been evaluated in one short-term study.⁹ Cats with acute pain and inflammation associated with musculoskeletal disorders received either 1.0 to 2.4 mg of robenacoxib/kg, q 24 h or q 12 h and were compared to cats receiving a positive control (ketoprofen 1mg/kg q 24 h). Robenacoxib administered once or twice daily was shown to be as effective as ketoprofen for controlling acute pain in cats. No significant side effects were reported in this shortterm study. Ketoprofen (1 mg/kg q 24 h) has been used as a positive control in two studies.^{8,9} In both short-term studies ketoprofen was effective in controlling clinical signs but was considered less palatable.

It is preferable to administer NSAIDs that are licensed for use in cats for the labeled indications because this signifies there is evidence to support their use. If NSAIDs are used off-label the owner should be made aware of this fact and of the potential risks and benefits. Owners should be informed of the possible side effects both verbally and in writing. This should include clinical signs to look for and an indication of when to call the veterinarian and stop treatment (e.g., vomiting, inappetence, bloody stool).

THERAPEUTIC FOODS: FELINE

Currently, there are two therapeutic foods indicated for management of cats with osteoarthritis. Royal Canin[®] – MediCal[®] Mobility Support[™] is available in Canada and the United States. The active ingredients are green-lipped mussel powder, glucosamine and chondroitin. The efficacy of this product is supported by one randomized controlled clinical trial.¹⁰ In this study, cats fed Mobility Support had greater objectively measured activity than cats eating the control diet; however, subjective evaluation by owners and veterinarians were not significantly different between the groups.

Hill's[®] Prescription Diet[®] j/d[®] Feline Mobility is available in the United States and Europe. The active ingredients include high levels of n-3 polyunsaturated fatty acids (DHA), natural



sources of glucosamine and chondroitin, methionine and manganese. High levels of n-3 PUFAs control inflammation in cats as in dogs. Unlike dogs, in cats DHA (rather than EPA) inhibits the aggrecanase enzymes responsible for cartilage degradation (**Figure 3**). Natural sources of glucosamine and chondroitin increase proteoglycan production by chondrocytes and inhibit inflammatory mediators. Methionine and manganese enhance chondrocyte viability, provide building blocks and act as a sulfur donor for the production of proteoglycans.



Figure 3. High levels of DHA control inflammation and slow the progression of arthritis in cats.

The efficacy of Prescription Diet j/d Feline is supported by three studies from one to three month duration.¹¹⁻¹³ In the open label study, 70% of veterinarians (33/47) and 96% owners (45/47) reported improvements in mobility of cats after one month of therapy.¹³ In a randomized controlled clinical study, Prescription Diet j/d Feline was fed to 41 cats with moderate to severe arthritis.¹² Alterations in both the ability to jump and the height of jump were the most frequent signs of disease. After one month of therapy, 61% of owners (25/41) reported marked improvement in their cat's clinical signs.

Subjective veterinary evaluation and objective evaluation with activity monitors were used to assess Prescription Diet j/d Feline in a crossover study.¹¹ Changes in cartilage biomarkers and metabolomic profiles were also evaluated. Activity monitors documented significant (49%) increases in activity, which correlated with significantly improved orthopedic evaluations in the cats while receiving therapy. While being fed j/d Feline, arthritic cats also had decreased biomarkers and metabolic markers of inflammation and cartilage degradation. Results of these three studies are similar to improvements seen in cats receiving meloxicam for chronic pain.

SUMMARY

Careful assessment of client-specific outcome measures is an important diagnostic tool for cats with impaired mobility. Therapeutic nutrition provides an effective and safe way to manage both dogs and cats with osteoarthritis. Foods with high levels of n-3 fatty acids have the dual benefit of controlling inflammation and cartilage degradation in cats with arthritis without the risks associated with long-term use of nonsteroidal anti-inflammatory drugs.

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