Evidence-Based Clinical Nutrition: Managing Canine Osteoarthritis

Osteoarthritis (OA) is the number one cause of pain for dogs in the United States and it has been estimated that 20% of dogs more than 1 year of age have degenerative joint changes. OA is a chronic, painful disease caused by cartilage damage and joint inflammation. Dogs may have reduced mobility with stiffness, limping, and difficulty rising. The chronic pain of arthritis not only decreases quality of life, but also length of life.

PROGRESSIVE DISEASE
Osteoarthritis can have many initiating events; however, there is a final common pathway of cartilage destruction. Any stress that damages chondrocytes (cartilage cells) can initiate the arthritis cycle. Most often, stress is related to trauma, injury, or normal wear and tear. Damage (with or without signs of inflammation) activates aggrecanase enzymes that cause cartilage degradation. This cartilage destruction occurs before clinical signs are obvious (pain, swelling, limping, etc). Unless the cycle is interrupted, the upregulation of aggrecanase enzymes will result in damage to the cartilage matrix (infrastructure) and eventually to structural or functional failure of the joint.

MANAGEMENT
Recent studies have demonstrated that eicosapentaenoic acid (EPA) – an omega-3 fatty acid – plays an important role in the management of canine arthritis. EPA is selectively stored in canine chondrocytes and helps to control joint inflammation. In addition to its antiinflammatory properties, EPA also interrupts the upregulation of mRNA, which signals production of the aggrecanase enzymes responsible for cartilage damage. Additional studies demonstrate that therapeutic foods with high levels of omega-3 fatty acids and a low ratio of omega-6 to omega-3 fatty acids reduce inflammation associated with osteoarthritis.

CASE STUDY
OA SIMON

Hx
12-year-old mixed breed
Castrated male
Body condition score 3.5 out of 5 (slightly overweight)

Dx
Chronic kidney disease (CKD)

PROBLEM
Stiff when getting up and reluctant to go up or down stairs.

SOLUTION
Please turn the page...
Simón's owners noticed that he was slow to get up when lying down and was reluctant to use the stairs. Both 4 and 6 years earlier he had undergone surgery for management of cruciate disease of the left and right stifles. Physical examination revealed pain on stifle palpation. Radiographic changes were consistent with osteoarthritis in both stifle joints.

**RECOMMENDATION**

The veterinarian recommended that Simon be fed Hill's® Prescription Diet® j/d™ Canine. After a transition period, Simon was eating and enjoying both j/d™ Canine canned and dry food every day. Within 30 days the owners noticed a difference in his activity level. He no longer hesitated climbing the stairs and got up to watch backyard birds at the feeder more frequently.

**OUTCOME & FOLLOW-THROUGH**

Simon continued to be fed j/d™ Canine. His owners also started a more consistent exercise program, walking him at least 30 minutes a day and doing passive range of motion exercises with him 3 times a week. Simon was more comfortable and active. Because of this he was able to exercise more and reached his ideal body weight in 4 to 6 weeks.

**STUDY – EVALUATION OF DIETARY MODIFICATION FOR TREATMENT OF OA**

**DETAILS**
- 31 client-owned dogs finished the study
- One group (72) fed test food
- One group (59) fed control food (dry commercial dog food)
- Randomized, double-masked control study

**TEST FOODS**
- 39-fold increase in total omega-3 fatty acid concentration
- 39-fold increase in EPA concentration
- 97% decrease in the omega-6:omega-3 ratio

**RESULTS**
- Dogs fed test food had significantly higher serum concentrations of total omega-3 fatty acids.
- Dogs fed test food had significantly improved ability to rise from a resting position and to run and play.
- Dogs fed control food showed no significant improvement in the 13 clinical variables assessed by dog owners.
- Mean scores for veterinary clinical evaluation of both groups, including relevant orthopedic signs, improved over the course of the study; however, differences between groups were not significant.

The food used in this study was Hill's® Prescription Diet® j/d™ Canine. This study indicates that nutritional management using a food with high levels of omega-3 fatty acids helps improve the clinical signs of OA in dogs, especially in the context of rising from a resting position, walking, running and playing.

**SUGGESTED READINGS**


**SUMMARY OF SELECTED STUDIES**

Studies in the laboratory as well as clinical trials have shown the effectiveness of omega-3 fatty acids in management of osteoarthritis. There are also many anecdotal reports and various studies that evaluate nutritional management of osteoarthritis. They vary in quality and design. The last paper listed reviews many of these.


* See EBM Grading System below

**Evidence-Based Medicine* Grading System**

GRADE I
Well-designed, randomized, controlled clinical trials with naturally occurring disease; prospective studies

GRADE II
Well-designed and controlled laboratory studies with naturally occurring disease

GRADE III
One of the following: Nonrandomized clinical trials, cohort or case-controlled studies, case series, acceptable disease models, or dramatic results from uncontrolled studies

GRADE IV
One of the following: In vivo laboratory studies, opinions based on clinical experience, descriptive studies, studies in another species, pathophysiologic justification, expert committee reports

* Quality of evidence grading system adapted from the U.S. Preventive Services Task Force, 2000.