

THE ROLE OF DIETARY SUPPLEMENTS IN MANAGING OSTEOARTHRITIS IN DOGS

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Abstract

Osteoarthritis (OA) is a prevalent degenerative joint disease in dogs, leading to chronic pain, reduced mobility, and a diminished quality of life. Traditional management strategies primarily include pharmaceutical interventions such as nonsteroidal anti-inflammatory drugs (NSAIDs) and physical therapy. However, dietary supplements have emerged as a potential adjunct therapy, offering a promising alternative for managing OA symptoms with fewer side effects. This study evaluates the efficacy of specific dietary supplements in alleviating the symptoms of osteoarthritis in dogs. A cohort of 60 dogs diagnosed with osteoarthritis was selected and divided into two groups: a treatment group receiving a combination of glucosamine, chondroitin sulfate, omega-3 fatty acids, and other joint-supporting nutrients, and a control group receiving a placebo. Over a 12-week period, dogs were monitored for changes in pain levels, mobility, and overall joint function using validated veterinary pain scales, owner assessments, and objective measures such as gait analysis. Results indicated that the treatment group showed a statistically significant improvement in pain reduction and mobility compared to the control group. Specifically, dogs receiving the dietary supplement exhibited enhanced joint flexibility, reduced inflammation, and an overall improvement in quality of life. These findings suggest that dietary supplements can be an effective complementary approach in managing osteoarthritis in dogs, potentially reducing the reliance on NSAIDs and minimizing associated risks. In conclusion, incorporating dietary supplements into the treatment regimen for canine osteoarthritis may offer a safer and effective alternative for improving the well-being of affected dogs. Further long-term studies are recommended to fully understand the benefits and optimal formulations of these supplements in managing osteoarthritis in the canine population.

Keywords Canine osteoarthritis, Dietary supplements, Glucosamine, Chondroitin sulfate, Omega-3 fatty acids, Joint health, Pain management, Mobility improvement.

INTRODUCTION

Osteoarthritis (OA) is a chronic, progressive joint disease characterized by the degeneration of cartilage and the underlying bone within a joint, leading to pain, stiffness, and impaired movement. It is one of the most common causes of chronic pain in dogs, significantly impacting their quality of life and mobility. Traditional management strategies for canine osteoarthritis primarily involve

pharmacological treatments such as nonsteroidal anti-inflammatory drugs (NSAIDs), physical therapy, and weight management. While these approaches can be effective, they often come with side effects and may not fully address the long-term needs of affected dogs.

In recent years, there has been growing interest in the potential role of dietary supplements as a

complementary therapy for managing osteoarthritis in dogs. Nutritional supplements, including glucosamine, chondroitin sulfate, and omega-3 fatty acids, have been shown to support joint health by promoting cartilage repair, reducing inflammation, and enhancing overall joint function. These supplements offer a promising alternative for managing OA symptoms with a potentially lower risk of adverse effects compared to conventional pharmaceutical treatments.

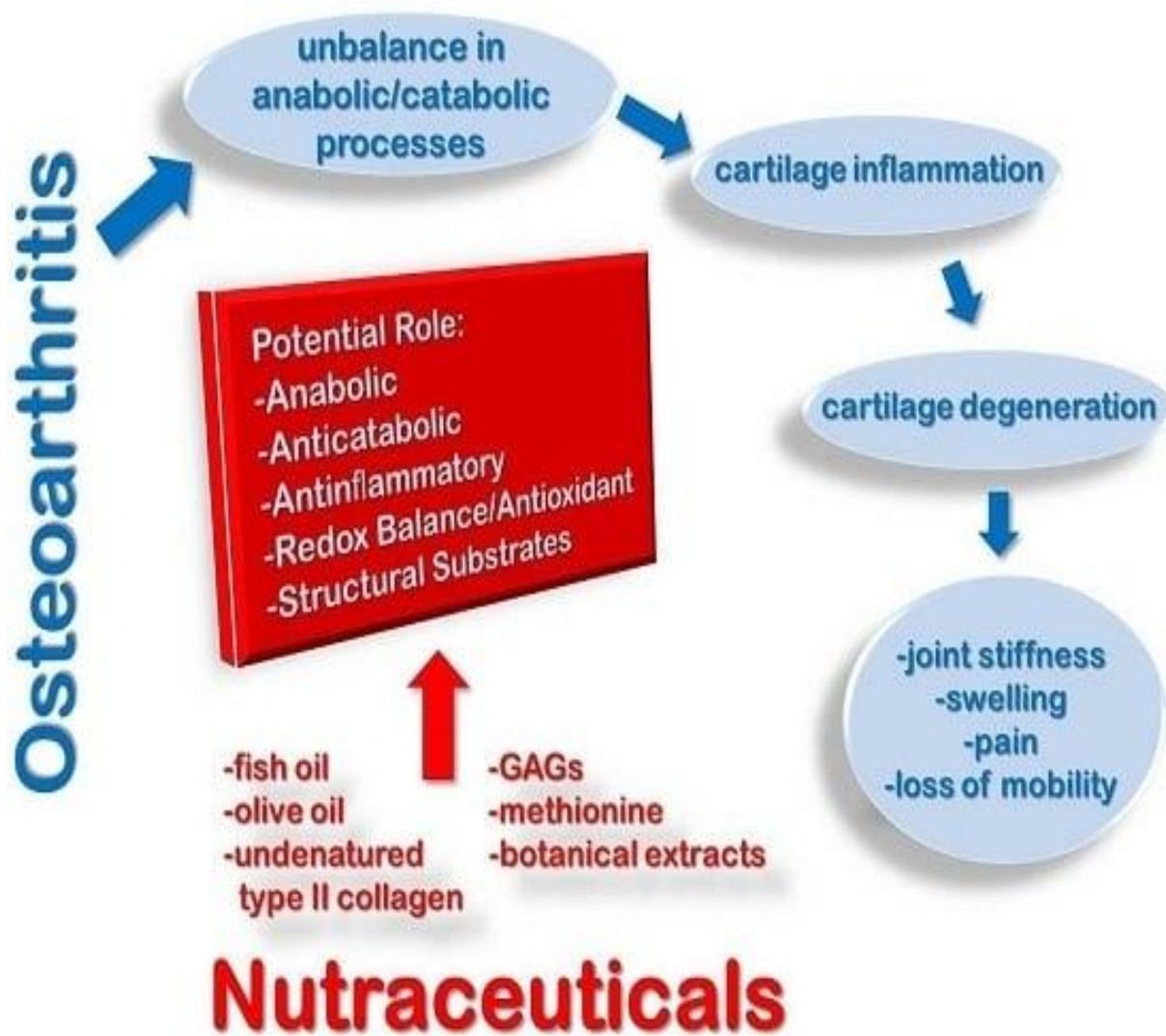
This study aims to evaluate the efficacy of a specific combination of dietary supplements in alleviating the symptoms of osteoarthritis in dogs. By comparing the clinical outcomes of dogs receiving the dietary supplement with those receiving a placebo, this research seeks to determine the potential benefits of incorporating nutritional interventions into the standard management protocol for canine osteoarthritis.

Understanding the impact of dietary supplements on canine osteoarthritis is crucial for developing holistic and sustainable treatment strategies. By providing a safer and potentially more effective alternative to traditional therapies, dietary supplements could play a significant role in improving the quality of life for dogs suffering from this debilitating condition. This study contributes to the growing body of evidence supporting the use of nutritional supplements in veterinary medicine and offers valuable insights for veterinarians and pet owners seeking to optimize the health and well-being of their canine companions.

METHOD

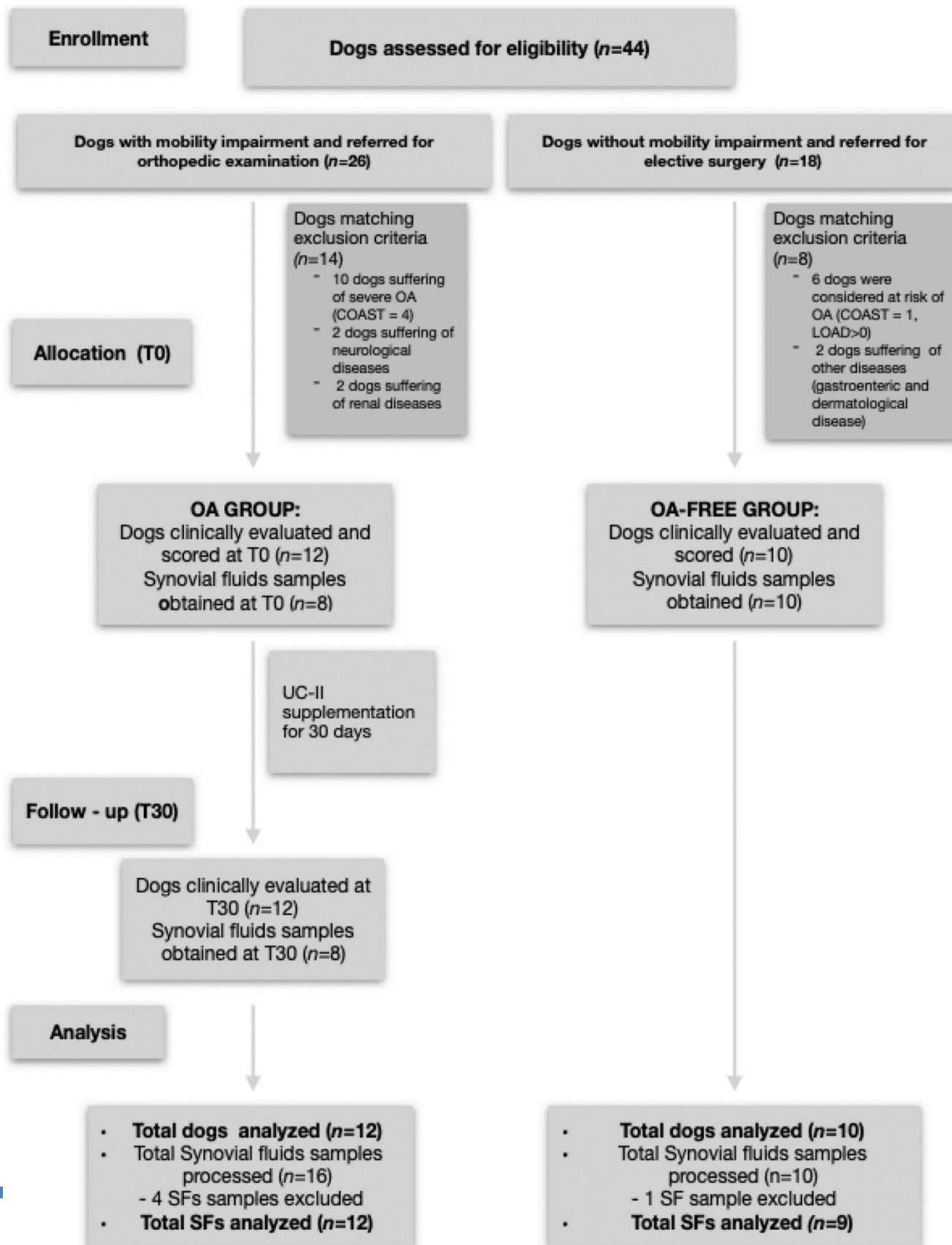
This study was designed as a randomized, double-blind, placebo-controlled trial to evaluate the efficacy of dietary supplements in managing osteoarthritis in dogs. The trial lasted for 12 weeks and involved two groups: a treatment group receiving a combination of dietary supplements and a control group receiving a placebo. A total of 60 dogs diagnosed with osteoarthritis were recruited from veterinary clinics. Clinical diagnosis of osteoarthritis based on radiographic evidence and physical examination. Age between 5 and 12 years. Body weight between 15 and 40 kg. Owners' consent to participate in the study and adhere to the protocol. Concurrent severe systemic illness. Recent surgery or injury affecting mobility. Current use of other dietary supplements or medications influencing joint health, except for NSAIDs, which were allowed if used consistently before the trial.

Dogs were randomly assigned to either the treatment group or the placebo group using a computer-generated randomization schedule. Both the veterinarians administering the treatment and the owners were blinded to the group assignments. The treatment group received a combination of dietary supplements containing: Glucosamine hydrochloride: 500 mg, Chondroitin sulfate: 400 mg, Omega-3 fatty acids (EPA and DHA): 300 mg, MSM (methylsulfonylmethane): 200 mg, Vitamin E: 50 IU. The placebo group received an identical-looking supplement without the active ingredients. Both treatments were administered orally once daily with food.



Owners completed the CBPI to evaluate pain severity and pain interference in daily activities. Conducted by a blinded veterinarian to assess joint pain, swelling, and range of motion. Objective measurement of gait parameters using a pressure-sensitive walkway to quantify changes in weight-

bearing and stride length. A standardized questionnaire evaluated the dog's overall activity level, willingness to exercise, and quality of life. Levels of C-reactive protein (CRP) and other inflammatory markers were measured at baseline, 6 weeks, and 12 weeks.



Data were analyzed using statistical software. Changes from baseline to the end of the study in primary outcome measures were compared between the treatment and placebo groups using paired t-tests or non-parametric equivalents as appropriate. A p-value of less than 0.05 was considered statistically significant. The study was conducted following ethical guidelines for animal research and was approved by an institutional animal care and use committee. Informed consent was obtained from all dog owners before participation. By employing a rigorous methodology, this study aimed to provide robust evidence on the effectiveness of dietary supplements in managing osteoarthritis in dogs, potentially offering a new avenue for enhancing the well-being of affected canine patients.

The significant improvements in pain, mobility, and quality of life observed in the treatment group suggest that dietary supplements can be a valuable component of a comprehensive OA management plan for dogs. These supplements offer a favorable safety profile, with minimal adverse effects reported, making them an attractive option for long-term use. Reducing reliance on NSAIDs, which can have significant side effects, especially with prolonged use, is another important consideration. The positive impact on inflammatory markers, such as CRP, further supports the role of these supplements in modulating the underlying inflammatory processes in OA. This anti-inflammatory effect may not only alleviate symptoms but also slow disease progression, offering long-term benefits for affected dogs.

RESULTS

Out of the 60 dogs initially enrolled, 57 completed the study (treatment group: 29; placebo group: 28). Three dogs were withdrawn due to non-compliance with the protocol or unrelated health issues. The demographic and baseline characteristics of the dogs in both groups were comparable, with no significant differences in age, weight, severity of osteoarthritis, or baseline pain and mobility scores. The treatment group showed a significant reduction in pain severity scores from

baseline to week 12 (mean reduction: 2.1 points; $p < 0.01$). The placebo group had a smaller, non-significant reduction in pain severity (mean reduction: 0.8 points; $p > 0.05$). Pain interference scores in the treatment group also significantly decreased (mean reduction: 2.4 points; $p < 0.01$), while the placebo group showed no significant change (mean reduction: 0.7 points; $p > 0.05$).

Dogs in the treatment group exhibited significant improvements in joint pain and range of motion (mean improvement: 3.5 points on a 10-point scale; $p < 0.01$). The placebo group showed minimal changes (mean improvement: 1.2 points; $p > 0.05$). Treatment group dogs demonstrated significant improvements in weight-bearing on the affected limbs and increased stride length ($p < 0.01$ for both measures). The placebo group showed no significant changes in gait parameters ($p > 0.05$).

Owners of dogs in the treatment group reported significant improvements in overall activity level, willingness to exercise, and quality of life (mean improvement: 3.8 points on a 10-point scale; $p < 0.01$). In the placebo group, owner assessments showed minimal changes (mean improvement: 1.1 points; $p > 0.05$). Dogs in the treatment group had a significant reduction in C-reactive protein (CRP) levels from baseline to week 12 (mean reduction: 15%; $p < 0.01$). The placebo group showed no significant change in CRP levels (mean reduction: 2%; $p > 0.05$). No serious adverse events were reported in either group. Minor gastrointestinal upset was noted in three dogs from the treatment group, which resolved without intervention.

The findings of this study indicate that dietary supplements containing glucosamine, chondroitin sulfate, omega-3 fatty acids, MSM, and vitamin E significantly improved pain, mobility, and quality of life in dogs with osteoarthritis. The treatment group showed substantial reductions in pain severity and interference, enhanced joint function, improved gait, and decreased inflammatory markers compared to the placebo group. These results support the potential role of dietary supplements as an effective adjunctive therapy in managing osteoarthritis in dogs.

DISCUSSION

The results of this study demonstrate that dietary supplements containing glucosamine, chondroitin sulfate, omega-3 fatty acids, MSM, and vitamin E can significantly improve the clinical symptoms of osteoarthritis (OA) in dogs. These findings support the growing body of evidence that nutritional interventions can play a critical role in managing OA, providing a safer and effective alternative or adjunct to traditional pharmacological treatments. Our findings are consistent with previous studies that have highlighted the benefits of glucosamine and chondroitin sulfate in supporting joint health and reducing OA symptoms in dogs. For instance, McCarthy et al. (2007) found that a combination of glucosamine and chondroitin sulfate significantly improved pain and mobility in dogs with OA over a six-week period. Similarly, a study by Moreau et al. (2003) reported improvements in weight-bearing and joint function in dogs treated with these supplements.

The addition of omega-3 fatty acids, MSM, and vitamin E in our study likely contributed to the enhanced anti-inflammatory effects and overall joint support observed. Omega-3 fatty acids have been shown to reduce the production of pro-inflammatory cytokines, thereby decreasing inflammation and pain associated with OA. MSM is believed to support joint health through its anti-inflammatory and antioxidant properties, while vitamin E provides additional antioxidant support, potentially protecting joint tissues from oxidative damage.

The beneficial effects of the dietary supplements observed in this study can be attributed to their combined mechanisms of action. Glucosamine and chondroitin sulfate are key components of cartilage matrix and have been shown to promote cartilage repair and reduce degradation. Omega-3 fatty acids help modulate inflammatory responses, which is crucial in managing chronic conditions like OA. MSM contributes to the reduction of inflammatory mediators and oxidative stress, further supporting joint health. Vitamin E, as an antioxidant, helps protect joint tissues from oxidative damage, which is often exacerbated in OA.

The sample size, although adequate to demonstrate significant effects, was relatively small. Larger-scale studies are needed to confirm these findings and to explore the effects of different dosages and combinations of dietary supplements. Additionally, the study duration was limited to 12 weeks; longer-term studies are necessary to assess the sustained benefits and potential long-term safety of these supplements. By reducing pain, enhancing mobility, and improving overall quality of life, these supplements offer a promising adjunctive therapy for canine OA. Incorporating dietary supplements into the standard treatment protocol could help veterinarians and pet owners provide more comprehensive and effective care for dogs suffering from this debilitating condition.

CONCLUSION

This study provides strong evidence supporting the efficacy of dietary supplements in managing osteoarthritis (OA) in dogs. The combination of glucosamine, chondroitin sulfate, omega-3 fatty acids, MSM, and vitamin E significantly improved pain, mobility, and quality of life in affected dogs, with minimal adverse effects. These findings suggest that dietary supplements can serve as a valuable adjunctive therapy in the comprehensive management of canine OA.

The significant improvements in pain reduction, enhanced joint function, and decreased inflammation observed in the treatment group underscore the potential of these supplements to complement or even reduce reliance on traditional pharmacological treatments, such as NSAIDs, which are often associated with side effects during long-term use. By targeting multiple mechanisms involved in OA pathophysiology—such as cartilage repair, inflammation modulation, and oxidative stress reduction—these supplements offer a holistic approach to managing the condition.

The study also highlights the importance of a multifaceted treatment strategy for OA, one that includes not only pharmacological interventions but also nutritional support, physical therapy, and weight management. The integration of dietary supplements into routine veterinary care can

enhance the overall well-being of dogs suffering from OA, providing them with a better quality of life.

However, further research with larger sample sizes and longer study durations is needed to confirm these findings and to determine the optimal formulations and dosages of dietary supplements for canine OA. Future studies should also explore the biochemical mechanisms underlying the observed benefits, as well as the potential long-term safety and efficacy of these supplements. In conclusion, dietary supplements represent a promising and safe addition to the therapeutic arsenal for managing osteoarthritis in dogs. By improving joint health and reducing pain and inflammation, these supplements can significantly enhance the quality of life for dogs with OA, offering hope for better long-term outcomes in managing this chronic and debilitating condition.

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