Krill Oil in Osteoarthritis Treatment: An Updated Review of Experimental Studies

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Introduction

Osteoarthritis (OA) is a common degenerative joint disease characterised by cartilage degeneration, synovial inflammation and chronic pain, with its prevalence increasing with age. While pharmacological treatments provide symptomatic relief, their long-term effects are limited and their side effects remain a cause for concern. These limitations have increased interest in alternative interventions. Krill oil, rich in omega-3 and astaxanthin, is considered a promising substance due to its anti-inflammatory, antioxidant, and chondroprotective effects. This study was conducted to evaluate recent experimental study regarding the efficacy of krill oil in the treatment of OA.

Methods

Scope and purpose: To integrate recent experimental evidence (2015–2025) encompassing clinical studies and in vivo animal models related to krill oil in osteoarthritis and contextualise mechanical signals (inflammation, oxidative stress, cartilage integrity).
Sources: PubMed and ScienceDirect were searched (January 2015–August 2025). Additional items were found through reference lists and author/keyword searches.
Search terms: “Krill oil”, “osteoarthritis”, “experimental”, “animal model”, “clinical trial”.Selection approach. Records were deliberately sampled based on relevance, recency, methodological clarity, and direct examination of OA pathophysiology or patient outcomes.
Exclusions: Only in vitro antioxidant tests, purely observational designs, reviews/meta-analyses, case reports, non-English items, and conference abstracts lacking full data.
Assessment: Studies were assessed qualitatively. No formal risk of bias tool was applied; effect sizes were reported as originally published.
Synthesis: Findings were organised thematically: (i) clinical symptoms and function, (ii) lipid/inflammatory/oxidative biomarkers, (iii) formulation and dosage considerations, (iv) animal model histology and cytokines.
Limitations: Incomplete search and subjective study weighting may create selection and publication bias; heterogeneous designs limit comparability between studies.

Results

Seven studies fulfilled the inclusion criteria: four clinical trials and three animal models. Clinical studies investigated krill oil supplementation at doses ranging from 300 mg to 2 g/day over 4–24 weeks. Several trials reported significant improvements in pain, stiffness, functional capacity, and lipid profiles among patients with knee OA, whereas others showed no superiority to placebo. A combined supplement containing krill oil, astaxanthin, and hyaluronic acid improved symptoms, though the isolated contribution of krill oil remained unclear. Animal studies consistently supported beneficial effects, demonstrating reductions in pro-inflammatory cytokines, protection of cartilage integrity, and attenuation of oxidative stress.

Conclusion

Current evidence suggests that krill oil may alleviate symptoms and modulate inflammatory and oxidative pathways in OA. However, due to the limited number of studies and methodological variability, these findings should be interpreted with caution. Further high-quality, long-term clinical trials are needed to clarify its therapeutic potential.

Keywords: Osteoarthritis, krill oil, clinical trials, anti-inflammatory effects