LUTEINE AND ZEAXANTINE SUPPLEMENTATION USE IN RHEUMATIC DISEASES: A REVIEW

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Carotenoids include both non-oxygenated carotenes and oxygenated xanthophylls. Among these, zeaxanthin and lutein are essential carotenoids that must be ingested through diet, as humans and animals are incapable of synthesizing them internally. These compounds fulfill multiple roles, such as safeguarding against damage from excessive light exposure, neutralizing reactive oxygen species (ROS) and other radicals, and preserving the structural and functional integrity of biological membranes. Zeaxanthin and lutein are particularly important for photoprotection, with emerging evidence indicating their contributions to visual and auditory processing, cognitive function, and various chronic diseases beyond ocular health [1].

Both age-related macular degeneration and Alzheimer's disease are inflammatory conditions associated with immune dysfunction and unchecked inflammation. It is reasonable to propose that carotenoids, due to their antioxidant and anti-inflammatory properties, may help mitigate some of these issues. A growing body of research has identified links between elevated carotenoid levels and a decreased risk of numerous inflammatory diseases [3].

In a cross-sectional study involving 4,513 participants, serum levels of lutein and zeaxanthin exhibited a positive correlation with walking speed and an inverse relationship with performance on the timed up-and-go test. Furthermore, higher baseline levels of these carotenoids were associated with a lower likelihood of developing frailty over approximately eight years of follow-up [2]. This information points to a potential benefit of lutein and zeaxanthin supplementation in managing rheumatic diseases characterized by frailty and sarcopenia. The relationship between carotenoid levels and musculoskeletal health highlights their broader implications beyond just ocular advantages.

An extensive literature search in PubMed, Scielo, and LILACS was performed without any language restriction until July 2024. We excluded review articles and in vivo and in vitro studies. We found only one article on lutein supplementation in rheumatology [4]. In a study on lutein supplementation in postmenopausal women, a randomized, double-blind, placebo-controlled trial with 100 participants was conducted. The study evaluated the use of paprika carotenoid extract (PCE), a rich source of carotenoids. The carotenoid composition of the PCE included 2.78 percent capsanthin, 2.13 percent -carotene, 1.54 percent -cryptoxanthin, and 1.21 percent zeaxanthin. Participants were given either PCE capsules (20mg/day) or a placebo for 24 weeks.

The study tracked bone turnover markers, focusing on TRACP-5b and sNTX for bone resorption, along with bone alkaline phosphatase and osteocalcin for bone formation. After 24 weeks of supplementation, the PCE group showed a significant decrease in TRACP-5b levels compared to the placebo group. However, there were no notable changes in sNTX or the markers for bone formation. In conclusion, one study on zeaxanthin supplementation in postmenopausal women found that this carotenoid reduced bone reabsorption. More studies are needed to confirm the present data, and novel studies in other rheumatic diseases are desired.

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