Anti-inflammatory and chondroprotective agents

Curcuma and astaxanthin with chondroitin sulphate, glucosamine sulphate and collagen hydrolysate

Curcuma – anti-inflammatory and pain-relieving

Turmeric curcuma is the most important bioactive component of the spice turmeric (Curcuma longa L.), also called turmeric. Curcumin is an aroma carrier of curcuma on the one hand and mainly responsible for the health promoting effects of turmeric on the other hand. Recent data show a significant analgesic and anti-inflammatory effect in art hrose. Good bioavailability is crucial for good effectiveness.

Curcuma and inflammation inhibition

The use of curcuma preparations for complaints of the musculoskeletal system is based on the following documented effects:

- anti-inflammatory effect (inhibition of cyclooxygenase, lipooxygenase and proinflammatory cytokines)
- cartilage-protective effect (inhibition of elastase, hyaluronidase, collagenase, cartilage-destructive cytokines)

In order to investigate the clinical efficacy of curcumin in patients with knee osteoarthritis, a randomized, double-blind, placebo-controlled study was conducted over a period of six weeks in patients with mild to moderate knee osteoarthritis. One part of the patients received curcumin in a dosage of 1.500mg per day while the other part received a placebo. The effectiveness of Curcumin was measured using the WOMAC index and the Le quesne index. Therapy with curcumin significantly improved pain and function statistically compared to placebo. No significant side effects occurred in any of the groups. The scientists conclude that curcumin can be an effective and safe alternative in the therapy of osteoarthritis.

Another study dealt with the efficacy and safety of curcuma plant extract in relation to pain reduction and joint function improvement. 367 patients with knee osteoarthritis and a pain score of 5 and higher received ibuprofen or curcuma plant extract over a period of 4 weeks. In the therapy of knee osteoarthritis the curcuma extract has the same effect iv as ibuprofen.

Both patient groups showed significant improvements in pain and steering function. In the curcuma group, however, abdominal pain and severe pain were significantly less frequent than in the ibuprofen Group.

Effects of curcuma on different organ systems

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**Astaxanthin - anti-inflammatory for joint problems**

Effective natural antioxidant used in various degenerative diseases of old age, the causes of which are based on oxidative stress or inflammatory processes. Astaxanthin has an anti-inflammatory effect. In-vitro studies and animal experiments have revealed that astaxanthin inhibits the production of inflammatory cytokines (cytokines are natural messengers occurring in the body through which the cells of the immune system communicate and fight each other in their common struggle against external attacks of the organism.) These inflammatory mediators and cytokines activate other immune cells and can cause chronic inflammatory diseases. Oberactivity is associated with chronic inflammatory diseases such as arteriosclerosis, cardiovascular disease, psoriasis, asthma, inflammatory bowel disease (Crohn's disease, ulcerative colitis) and rheumatoid arthritis. In the numerous studies, 2 to 6 mg is usually used as the dose.

**Chondroprotectives with active evidence 1A**

**Glucosamine sulphate and Chondroitin sulphate**

Glucosamine and chondroitin sulphate belong to the substance class ofSYSADDA (Symptomatic Slow-Acting Drugs in Osteoarthritis). They are counted among the chondroprotectives (cartilage degeneration inhibiting substances) with an effect evidence of 1A.

Various clinical studies in the USA and Europe have shown that glucosamine sulphate and chondroitin sulphate in combination not only have decongestant and pain-relieving properties in joint problems, but can also restore damaged cartilage and tendon tissue. The side effect rate was comparable to that of placebo. Chondroprotectives can reduce pain in inflamed joints just as effectively as conventional painkillers (NSAID), but are superior to them due to their longer lasting efficacy and good tolerability.

A meta-analysis (2015) with 54 studies and a total of 16427 patients confirmed once again that the combination of glucosamine and chondroitin sulphate is most effective in improving the function of the knee joints.

**Effects of chondroitin and glucosamine sulphate**

- **Structural modification of the cartilage**
- **Long-lasting pain relief**
- **Improves joint function**
- **Mobility**
- **Good tolerability**

Collagen hydrolysate was found to increase the collagen II synthesis up to 2.5 times dose-dependent. After taking collagen peptides from collagen hydrolysate, the endogenous synthesis of all collagen types is stimulated (type 1 to type V). Diverse studies have shown that collagen hydrolysate is highly effective to prevent:

- **pain relief**
- **revenue reduction of painkillers**
- **Improvement of joint function**
- **marked improvement of the joint condition**

**Collagen hydrolysate - for connective tissue, tendons, ligaments and joint cartilage**

Collagen is a long-chain fibrous protein that has the same amino acid structure as collagen in articular cartilage and contains particularly high levels of the connective tissue-forming amino acids proline, hydroxyproline and glycine. In the form of collagen hydrolysate it is the ideal building material supplier for all collagen types, in particular type II collagen in tendons, ligaments and joint cartilage.

In the studies, which showed a significant improvement in joint function and a significant reduction in pain, 10 g collagen hydrolysate was taken daily for 8 to 24 weeks.

**Stimulation of collagen synthesis**

The effect of collagen hydrolysate in native cartilage tissue was tested. A cell culture of bovine chondrocytes was incubated with collagen hydrolysate for three days. Subsequently, the cell culture was incubated for a further 8 days. The controls used were preparations with native collagen or collagen-free protein hydrolysate.

**Antioxidants**

- **Vitamins**: C, E, D, <2
- **Oligo elements**: Mn, Cu, Zn, Se + silicon
- **Antioxidants**: Ginger, grape seed extract

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