Vitamin C and Joint Disease

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Joint disease affects numerous people around the world. Osteoarthritis is one type of join disease which affects joints causing chronic pain, loss of joint function, erosion of joints and joint deformity (Pinto, Rao, & Rao, 2008). However, rheumatoid arthritis is another chronic inflammation of the tissue around the joint and is an autoimmune disease which will destroy the bones in the joints. Prostaglandins causes inflammatory responses and can cause the joint damage in rheumatoid arthritis when there is an imbalance of free radical production and antioxidants (Meki, Hamed, Hamed, & Exam, 2009). Another from of inflammatory arthritis is gout which mostly affects men. In gout, uric acid crystals build up in the joints and cause significant pain and inflammation (Choi, Gao, & Curham, (2009).

Alternative medicines have been used to treat joint disease. The study by Pinto, Rao, & Rao (2008) discusses the use of such alternative medicines to treat patients suffering form osteoarthritis in their knees. The homeopathic therapy consisted of a combination of multiple herbs. The sample size was 81 patients, 31 males and 50 females, in the age range of 20 to 75 years. A blood test was administered at the beginning of the study and 3 months into the study. The first blood test of the osteoarthritic patients was compared to the blood test of the control group which found that the red blood cell lipid peroxidase was considerably higher in the osteoarthritic patients. Also higher in that group were the superoxide dismutase results. However, the vitamin C level and the antioxidant activity in the serum was noticeably lower in the osteoarthritic patients in comparison with the control group. The second test after 3 months and the consumption of homeopathic herbs found a decrease in lipid peroxidase, but the vitamin C showed hardly any improvement. The lower level of vitamin C and the decrease in antioxidant suggests that there is an affect by an excess of the reactive oxygen species in the patients (Pinto,

Rao, & Rao, 2008). The study by Mahajan, Kaur, Mahajan, & Kant (2009) also showed a decrease in the plasma vitamin C level of the patients. The vitamin C level decreased with an increase of the duration of the disease. This also seems to indicate that vitamin C neutralizes the free radicals (Mahajan, Kaur, Mahajan, & Kant, 2009). .

The study by Mahajan, Kaur, Mahajan, & Kant (2009) was made up of 100 participants which all suffered and showed symptoms of active rheumatoid arthritis (RA) which was not only indicated by pain and stiffness of the joints but also verified by additional blood tests. This study also tested uric acid and vitamin C as an antioxidant and found just as vitamin C decreased in RA patients so did uric acid. Their results were that the plasma uric acid level was significantly lower in patients with a longer period of RA than in patients with a shorter period of the disease. This study indicates that uric acid acts as an antioxidant by retrieving free radicals and preventing lipid oxidation This suggests that the cause of low plasma level of uric acid is that uric acid is trying to compensate for the oxidation process. The authors explain the reason uric acid contributes more to the antioxidant process than vitamin C is that uric acid has a higher concentration in the plasma. The authors of this study warn that a too low uric acid blood serum can hinder the antioxidant effects. In addition to increasing the effects of uric acid, an increase of vitamin C should be given to the patients (Mahajan, Kaur, Mahajan, & Kant, 2009)

In contrast to the Mahajan, Kaur, Mahajan, & Kant (2009) study, which favors a higher uric acid level, the study by Choi, Gao, & Curham (2009) prefers a lower uric acid level since a high level forms crystals in the joint causing gout. The study was performed on 49,774 male subjects from 1986 to 2006 and is still an ongoing longitudinal study. In 1986 participant ages ranged between 40 to 75 years. Each of those participants was questioned on his vitamin C dietary intake including more than 130 different types of foods and beverages on a questionnaire.

This questionnaire was updated every four years. A questionnaire was sent to the subjects every two years asking them about doctor diagnosed incidents of gout. The longitudinal study found that in the 20 years 1,317 new gout cases were reported. They also found that participants with higher intake of vitamin C, decreased their meat and coffee consumption and ate more seafood. The overall finding in his study was that an increase in vitamin C consumption is directly related to reduction in gout occurrences. The explanation of the reduction of gout was that vitamin C increased the excretion of uric acid through the urine and causing the plasma uric acid levels to drop. The drop in plasma uric acid prevents the forming of crystals and helps in dissolving them in the joints. This study suggests that vitamin C consumption might be decreasing the risk of gout (Choi, Gao, Curham, 2009).

The results of the study by Meki, Hamed, Hamed, & Exam (2009) showed that both vitamin C and green tea lowered the lipid peroxidase in rats and the lowering of lipid peroxidase agreed with the findings in the study by Pinto, Rao, & Rao (2008). The study also found that the plasma level of nitric oxide, uric acid, cerulaplasmin, copper, prostaglandin E_2, superoxide dismutase, zinc was elevated when compared to the positive control group. The increased level of lipid proxide, nitric oxide, cerulaplasmin, copper and PGE_2 indicates an inflammatory response in the joints. This study suggests that an increase in anitoxitants is important to reduce the free radical generation in rheumatoid arthritis patients. While vitamin C was effective in its antioxidative effects, and it could reach higher efficacies if additional supplements are taken, green tea, however, provides a greater protection against free radicals, has no known side effects, and is low in cost (Meki, Hamed, Hamed, & Exam, 2009).

References

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