Immune inflammation and DNA damage abstract

Abstracted by Marcia J. Egles,MD from Astaxanthin decreased oxidative stress and inflammation and enhanced immune response in humans by Jean Soon Park et al in Nutrition & Metabolism 2010, 7:18 .

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An initial study has reported that astaxanthin, a naturally occurring carotenoid, may help reduce inflammation, enhance immune function, and protect against DNA damage in humans (1).

Like lutein and beta-carotene, astaxanthin is a carotenoid pigment. Astraxanthin gives salmon, trout, shrimp and flamingos their pink hue. The primary source of astaxanthin for these animals is an algae, Haematococcus pluvialis, which they consume through the food chain. Astraxanthin as a dietary supplement is also derived from this algae. Commercially, astaxanthin has been used as a food coloring to intensify the pink color of supermarket salmon.

The study is the first published astaxanthin research performed in human subjects (1). Previous studies have been performed with laboratary tests(2) and in animals. Mice fed astaxanthin showed indications of robust immunity and reduced inflammatory reactions (3,4,5). A prior study done in mice (by the same researchers as this human study) demonstrated an inhibition of mouse breast tumors by astaxanthin (6).

Forty-two healthy, nonsmoking Korean college women, 20 to 23 years old, participated in this eight week dietary trial. They were randomly assigned to receive placebo capsules or astaxanthin supplements in a daily dose of 2 or 8 milligrams. Subjects were allowed to continue their usual diets with the exception that they avoid astaxanthin-rich foods such as salmon, lobster and shrimp. Serum astaxanthin levels at the start of the study were undetectable in all of the women.

When tested after four weeks of supplementation, the serum of both groups of supplemented women had reached maximum dose-dependent levels of astaxanthin. The higher dose group had a mildly higher astaxanthin serum level (0.13 milligram per deciliter in the high dose group, 0.09 mg per deciliter in the lower dose group, and zero in the control group). Levels remained unchanged at eight weeks.

The study found indications of dietary astaxanthin enhancing immune function, decreasing inflammation, and decreasing a DNA damage marker. Both groups who received astaxanthin showed increases in the numbers and activity of some of their blood cells involved in providing immunity. Plasma C-reactive protein, which is a non-specific indicator of inflammation, was reduced by over a third in week eight in the 2 milligram per day group and by about 20% in the 8 milligram group as compared to control. One marker of DNA damage from oxidation, 8-hydroxy-2 deoyguanosine, was reduced by over 50 per cent by week 4 in both groups who received astaxanthin.

At this early point the clinical implications for astraxanthin are yet to be determined by future research. It is possible that astaxanthin may prove useful in disease prevention and treatment.

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