

AMD and Systemic Vascular Disease: Are They Connected?

Omega-3 index values are inversely associated with the risk of mortality from coronary heart disease.

BY MICHAEL B. GROSS, MD

For decades, scientists have hypothesized that age-related macular degeneration (AMD) and cardiovascular disease share similar pathophysiologies and risk factors.¹ Further investigation has led to an availability of mature data in both clinical subsets. One of the first peer-reviewed reports in this regard appeared in a 2009 issue of *Ophthalmology*. This study of more than 2,000 participants concluded that patients with early AMD had a 25% higher cumulative incidence of coronary heart disease (CHD) during a 7-year follow-up period compared with participants without early AMD.²

Do AMD and CHD have a common denominator?

LACK OF AN ESSENTIAL NUTRIENT: OMEGANEMIA

An estimated 7.3 million people have been diagnosed as having early AMD, which is usually associated with no or moderate vision loss.³ Recent studies have shown that omega-3 eicosapentaenoic acid and docosahexaenoic acid from fish decreases the incidence of AMD by up to 45% and that increased intake of omega-3s can reduce the disease's progression by up to 25%.⁴⁻⁵

In 2008, a study in the *Journal of the American College of Cardiology* documented not only the cardiovascular benefits of marine-derived omega-3 fatty acids, but also the detrimental association of dietary intake that is high in omega-6—something that often accompanies a deficiency in omega-3s.⁶ This unbalanced omega-6-to-omega-3 ratio accompanied by marine-based omega-3 deficiency has a downstream effect that results in chronic systemic inflammation, which may become manifest in one or more organ systems. I refer to this omega-3 deficiency and

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the omega-3-to-omega-6 imbalance as *omeganemia*.⁷

A meta-analysis published in the *Archives of Ophthalmology* in June 2008 showed that a high intake of omega-3 fatty acids from fish may reduce the overall risk of AMD by up to 38%.⁸ A study in the *British Journal of Ophthalmology* highlighted that individuals with the highest consumption of omega-3 (DHA and EPA) enjoyed the most protection against the progression to advanced AMD. The *British Journal of Ophthalmology* study also suggested that “this may reflect the fact that Western diets provide low levels of omega-3 fatty acids, and that increasing levels of omega-3 fatty acid intakes would enhance prevention of advanced AMD in a population consuming a Western diet.”⁹

The hypothesis of an increased overall cardiovascular health benefit associated with the consumption of high amounts of marine-derived EPA and DHA was introduced by a study of Greenland's Inuit population.¹⁰ Further research among the various worldwide Inuit groups has confirmed that a greater intake of EPA alone or EPA plus DHA reduces the risk of CHD.⁶ Evidence from a Genetics of Coronary Artery Disease in Alaska Natives (GOCADAN) study also indicated that the incidence of CHD is rising in this population. The increase is

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linked to the introduction of massive amounts of omega-6s (shortening and other saturated fats) into their newly Westernized diet.¹¹

Is there a way to measure a dose of a marine source of EPA plus DHA that will reverse or prevent this concept of omegeanemia? Yes.

MEASURING CLINICAL OUTCOMES

The HS-Omega Index (OmegaQuant, LLC, Sioux Falls, SD) test is a clinically proven tool that identifies the percentage of EPA plus DHA in red blood cell membranes. The results are given as a percentage of the cell membrane's total fatty acid composition. Researchers from Saint Luke's Hospital in Kansas City tested the clinical relevance of this biomarker. They found that omega-3 index values are inversely associated with the risk of mortality from CHD. An omega-3 index of greater than 8% was associated with the greatest cardiovascular protection, and an index of less than 4% was associated with little or no cardiovascular protection.¹² The authors concluded that the HS-Omega Index test is an independent and relevant tool, the results of which can be used to determine an individual's risk of developing CHD; it warrants widespread use. An omega-3 index of 8% or greater can be achieved with the daily intake of 1 to 3 g of omega-3 EPA plus DHA from the consumption of fish (triglyceride form) or the equivalent by supplementation.¹²

THE QUICKEST WAY TO REACH THERAPEUTIC LEVELS

A recent double-masked placebo-controlled study using the HS-Omega-3 Index test investigated the percentage of EPA plus DHA in red blood cells after supplementation with two different omega-3 fatty acid formulations: ethyl ester and re-esterified triglycerides.¹³

A group of 150 volunteers consumed 1.68 g of marine sources of EPA plus DHA daily for 6 months. The omega-3 index was determined at baseline, after 3 months, and again at 6 months. Lead author Juliane Neubronner, MD, reported, “As the resulting omega-3 index was significantly higher after omega-3 fatty acid re-esterified triglycerides administration compared with omega-3 fatty acid-ethyl

ester, the results indicate that the re-esterified triglyceride is superior to ethyl ester in view of the EPA plus DHA tissue incorporation following a long-term administration.”¹³ This finding confirmed that of an earlier study by Jorn Dyerberg, MD, pioneer of the concept of the benefits of omega-3s.¹⁴

Absorption and bioavailability are recognized as the most important metrics of the efficacy of omega-3s. The HS-Omega-3 Index test can now confirm that therapeutic outcomes for the prevention and treatment of AMD (and thus systemic vascular disease) are best achieved through the consumption of a re-esterified triglyceride form of omega-3. ■

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