Higher DHA Omega-3 Levels Found in Heart Tissue of Cadavers with Low Cardiac Mortality

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Reference:

Cardiac Mortality is Associated with Low Levels of Omega-3 and Omega-6 Fatty Acids in the Heart of Cadavers with a History of Coronary Heart Disease


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Summary:

Cardiac tissue is known to be particularly rich in DHA omega-3. Cell membranes in heart tissue accrue even higher levels of DHA (and EPA to a lesser extent) upon the consumption of dietary fish oils containing EPA plus DHA. Further, this enhancement of cardiac cell membranes in DHA has often been credited with the anti-arrhythmic effect of DHA and the reduced risk of sudden cardiac death with higher intakes of fish/fish oils. In the present study, the investigators measured the fatty acid (including omega-3) contents of human cardiac tissue from 100 cadavers who died from cardiac or non-cardiac mortality. For those cadavers with a history of heart disease, the cardiac levels of DHA plus EPA (sum) were significantly lower (by 39 % ) in those who died from a cardiac cause as compared to those who died of a non-cardiac cause. Since DHA represented at least 95 % of the (DHA plus EPA) contents, the DHA omega-3 contents were also significantly lower (by 42 % overall) in the corresponding cardiac tissue from those who died of cardiac causes. The authors indicate that the lower levels of DHA omega-3 in heart tissues appear associated with a higher risk of cardiac mortality in those with a history of coronary heart disease.

Dr. Holub's Comments:

Since the DHA: EPA ratio in human cardiac tissue is so very high (20 : 1 and more in this study)
which is much above typical dietary ratios (typically in the range of approximately 3 : 1 ), it is tempting to suggest that the anti-arrhythmic effect of the long-chain omega-3 fatty acids may be due to DHA alone. However, the mechanisms underlying the effects of the long-chain omega-3 fatty acids with respect to a reduced risk of sudden cardiac death are considered to involve numerous mechanisms which operate both within and external to cardiac tissue itself. Both DHA and /or EPA have been found to favorably influence many of these mechanisms.

Increased intakes of DHA plus EPA from fish/fish oils increase both DHA plus EPA levels in the circulating blood as well as in human cardiac tissue with the net rise in cardiac DHA being dramatically more substantial than that for EPA upon increasing fish consumption.