Abstract


Omega-3 polyunsaturated fatty acid blood biomarkers increase linearly in men and women after tightly controlled intakes of 0.25, 0.5, and 1 g/d of EPA + DHA.

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OBJECTIVE: Blood levels of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been related to coronary heart disease risk. Understanding the response of EPA + DHA in blood to dietary intake of EPA + DHA would facilitate the use of blood measures as markers of adherence and enable the development of dietary recommendations. The objective of this study is examine the blood response to intakes of EPA + DHA ≤1 g/d with an intervention designed for dietary adherence.

METHODS: It was hypothesized this relationship would be linear and that intakes of EPA + DHA <1 g/d would result in blood levels below those associated with the highest level of protection for cardiovascular events. Background EPA + DHA intake of men and women (n = 20) was determined by food frequency questionnaire and adherence was monitored by weekly fingertip blood sampling for fatty acid determinations. Participants consumed nutraceuticals to achieve intakes of 0.25 g/d and 0.5 g/d EPA + DHA for successive four-week periods. A subgroup (n = 5) had intakes of 1.0 g/d EPA + DHA for an additional 4 weeks. Fatty acid composition of whole blood, erythrocytes, and plasma phospholipids were determined at each time point.

RESULTS: Blood levels of EPA and DHA increased linearly in these pools. A comprehensive review of the literature was used to verify the blood-intake relationship. Blood levels of long chain omega-3 polyunsaturated fatty acids reached blood levels associated with the highest levels of primary cardiac arrest reduction and sudden cardiac death risk only with intakes of 1.0 g/d of EPA + DHA.

CONCLUSION: The blood biomarker response to intakes of EPA + DHA ≤1 g/d is linear in a small but highly adherent study sample and this information can assist in determining adherence in clinical studies and help identify dietary intake targets from associations between blood and disease.

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