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Red blood cell omega 3 index as biomarker of cardiovascular and neurodegenerative disorders

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Background: It is now widely accepted that dietary supplementation with fish or fish products reduces the risk of cardiovascular diseases. The beneficial effects of seafood intake have been attributed to the content of n-3 fatty acids. The aim of the present study was to assess the effects of fish consumption on erythrocyte phospholipids in two different studies.

Methods: Study 1: Volunteers aged 20-40 years were randomized in two groups with the consumption of hipocaloric diets with 30% energy restriction during 8 weeks with a cod diet (3x150 g/week) or a salmon diet (3x150 g/week). Study 2: Portuguese sample-population mean age 50.4±12.7 years, was followed for 4 weeks. The volunteers ate their usual diet and supplemented it with two canned sardine per week. Fatty acid profile of erythrocyte (RBCs) phospholipids was determined at baseline and endpoint by GC-FID.

Results: In both dietary interventions n-3 fatty acids increased in RBCs membrane. In study 1, Omega-3 Index (O3I) attains 7.1% in lean fish group and higher than 8% in fatty fish group. In Portuguese sample population (study 2) the O3I correlated positively (rs=0.53) with the sum of EPA+DHA in diet at baseline, and after 4 weeks of supplementation EPA increased ~33% in RBCs.

Conclusions: The present results demonstrated that RBC membrane fatty acids obtained, are a good biomarkers in both epidemiological and clinical studies to follow changes in fatty acid profile in blood after dietary intervention. Omega-3 index confirms that fish products produce changes in erythrocyte membrane composition.

Biography

Narcisa Bandarra (PhD), is Head at the Nutrition Laboratory, IPMA, and has a consolidated experience concerning the influence of 3-enriched diets in terms of incorporation of 3 fatty acids in the phospholipid fraction of animal tissues (kidney, liver, muscle and aorta) and human plasma and erythrocytes in normal and chronic patients (hemodialysis, cardiovascular, obesity, neurological disturbs). She has participated in several clinical studies related to the prevention of chronic diseases, particularly cardiovascular and has been responsible for the determination of fatty acid profile and lipid classes of plasma and erythrocytes phospholipids. She has published more than 90 papers in reputed journals.

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