Polyunsaturated Fatty Acids in Australian Adolescents

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Background: Blood levels of omega-3 fatty acids (FAs) reflect the interaction between metabolism and ingestion of omega-3 rich foods. Evidence suggests that reduced blood and/or tissue levels of omega-3 fatty acids, as indicated by the erythrocyte eicosapentaenoic acid plus docosahexaenoic acid levels as a percentage of total FAs, (ie, the omega-3 index) is associated with increased risk of developing atherosclerotic pathology (AP). Proposed omega-3 index risk zones are: high risk, <4%; intermediate risk, 4–8%; and low risk >8%.

Aim: The aim of this study was to quantitate the erythrocyte omega-3 and 6 polyunsaturated fatty acids (PUFAs) in an Australian adolescent population.

Method: Using gas chromatography we analysed the erythrocyte FA content of 93 adolescents aged 16 to 18 years, from schools in the NSW Central Coast region. 23 females and 70 males participated in the study.

Results: The mean erythrocyte concentration of omega-3 and 6 PUFAs were found to be 9.82% and 30.48% respectively. Only a small proportion (2%) of the participants had an omega-3 index >8%, an indicator of low risk of developing AP. A large majority (94%) had an omega-3 index between 4-8%, suggestive of intermediate risk of developing AP. The remaining 4% of the participants had an omega-3 index <4% suggesting high risk of developing AP.

Conclusion: A high percentage of adolescents have less than optimal levels of omega-3. This may predispose this population to the development of coronary heart disease in later life. Adolescents need to be educated about the health benefits and dietary sources as well as requirements for omega-3 PUFA intake.