Correlation between Supplemental Omega-3 Fatty Acid Intake and Omega-3 Index in Adults
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ABSTRACT

Background: One potential way to protect the heart and reduce the risk for cardiovascular diseases is to consume sufficient long chain omega-3 fatty acids (n-3), especially eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) from fish or supplemental fish oil. Several recent studies reported omega-3-index (O3I) as a marker for coronary heart disease (CHD), indicating O3I below 4% as a higher risk while 8+% as a lower risk.

Objective: The aim of the present study is to observe the correlation between red blood cell (RBC) O3I level and EPA+DHA intake from the supplemental fish oil in adults.

Methods: Seventy-six males (average age: 72 yr; BMI: 27.6) and 170 females (average age: 62 yr; BMI: 26.0) from USA and Canada voluntarily participated in the study after obtaining the informed consent form. Information on the supplemental n-3 intake from EPA+DHA in ethyl ester form was obtained by online questionnaires. RBC membrane fatty acid composition was analyzed by gas chromatography from overnight fasting blood samples, and O3I levels were expressed as EPA+DHA % of total fatty acids.

Results: The average supplemental EPA+DHA intake was 1.36 g/d in all subjects, 1.26 g/d in females, and 1.58 g/d in males. The average O3I was 8.63% in all subjects, 8.59% in females, and 8.70% in males. A significant and positive correlation (p<0.001) was observed between EPA+DHA intake and O3I. There was no significant difference in O3I between females and males although females ingested significantly lower amount of supplemental EPA+DHA as compared to the males (p=0.01).

Conclusion: The present study showed that the average O3I in adults supplementing with fish oil containing omega-3-fatty acids (average 1.36 g/d of EPA+DHA) was higher than 8.5% in average, suggesting that O3I is influenced by their daily EPA+DHA intake from the dietary supplements containing ethyl ester form of EPA+DHA.

Keywords: omega-3-index, fish oil, omega-3 fatty acids, EPA, DHA