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The influence of fish consumption on the omega 3 index in low fish consuming women of childbearing age: findings from the iFISH study

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The n-3 polyunsaturated fatty acids (n-3 PUFA), eicosapentaenoic acid (EPA; 20:5n-3) and docosahexaenoic acid (DHA; 22:6n-3), are known for their beneficial roles in regulating inflammation⁽¹⁾. The omega 3 index (O3I) refers to the percentage of EPA+DHA within the erythrocyte membrane with respect to total fatty acids and is a recognised biomarker for cardiovascular disease⁽²⁾. An O3I >8% is proposed to confer the greatest level of cardioprotection⁽²⁾. Fish is the richest dietary source of n-3 PUFAs and has been noted as one of the main predictors of a higher O3I⁽³⁾. Current UK dietary guidelines recommend the consumption of two portions of fish per week; albeit the efficacy of these recommendations in raising the O3I is unknown⁽⁴⁾. The aim of this study was to investigate the influence of consuming two portions of fish per week on the O3I amongst low fish consuming women of childbearing age.

Data were analysed from the iFish study⁽⁵⁾, an 8-week randomised controlled trial where low fish consuming women, were randomly assigned to consume either no fish (n = 18) or 2 portions of tuna (n = 8) or sardines (n = 9) per week. Total n-3 PUFA concentrations of the fish provided in the intervention were 6.47g/100g for sardines and 4.57g/100g for tuna. Fasting blood samples were collected at baseline and post-intervention. The O3I was determined in red blood cells in the control and two portions of fish groups by OmegaQuant Europe. Analysis of covariance, adjusting for age, BMI, and baseline O3I, examined the effect of the fish intervention on the O3I. Chi-square test was used to compare the O3I between groups when categorised as at risk (<4%), intermediate risk (48%) and low risk (>8%).

Participants had a mean ± SD age of 25.5 ± 6.4 years. Baseline median (IQR) O3I of the cohort was 5.7 (5.2, 6.7) %. There was no significant difference in the O3I between treatment groups at baseline. Consumption of two portions of fish significantly increased the O3I when compared to the consumption of no fish [6.73 (5.41, 7.38) % vs 5.58 (5.12, 6.49) %, respectively, $p = 0.034$]. Those consuming two portions of sardines, an oily fish high in n-3 PUFAs, had a significantly greater O3I when compared to those consuming two portions of tuna [7.38 (6.83, 8.37) % vs 5.61 (5.29, 6.79) %, respectively, $p < 0.001$]. Post-intervention, the proportion of participants in the low risk O3I category (>8%) was greater in the two portions of fish group when compared to the control group; albeit this did not reach statistical significance ($p = 0.104$).

In support of the current dietary guidelines, increasing fish consumption of low consumers to two portions of any fish per week will increase the O3I. Future research should determine the potential cardioprotective properties of a higher O3I as a result of consuming fish.

References

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