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Title: Increased dietary alpha-linolenic acid has sex-specific effects upon eicosapentaenoic acid status in humans: re-examination of data from a randomised, placebo-controlled, parallel study

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Abstract: Background: There is a metabolic pathway by which mammals can convert the omega-3 (n-3) essential fatty acid alpha-linolenic acid (ALA) into longer-chain n-3 polyunsaturated fatty acids (LC n-3 PUFA) including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). As far as we know there are currently no studies that have specifically examined sex differences in the LC n-3 PUFA response to increased dietary ALA intake in humans, although acute studies with isotope-labelled ALA identified that women have a significantly greater capacity to synthesise EPA and DHA from ALA compared to men.

Findings: Available data from a placebo-controlled, randomised study were re-examined to identify whether there are sex differences in the LC n-3 PUFA response to increased dietary ALA intake in humans. There was a significant difference between sexes in the response to increased dietary ALA, with women having a significantly greater increase in the EPA content of plasma phospholipids (mean +2.0% of total fatty acids) after six months of an ALA-rich diet compared to men (mean + 0.7%, P = 0.039). Age and BMI were identified as predictors of response to dietary ALA among women.

Conclusions: Women show a greater increase in circulating EPA than men during increased dietary ALA consumption. Further understanding of individual variation in the response to dietary ALA could inform nutrition advice, with recommendations being specifically tailored according to habitual diet, sex, age and BMI.

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