

Poster presentation

## Effect of eicosapentaenoic and docosahexaenoic acid on resting and exercise-induced inflammation and oxidative stress

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### Background

The fish oils eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been reported to provide antioxidant and anti-inflammatory benefits at rest. The purpose of this study was to determine the effects of EPA/DHA supplementation on resting and exercise-induced inflammation and oxidative stress in trained men.

### Methods

14 men ( $26 \pm 5$  yrs) supplemented with 2224 mg EPA (MorEPA Mini; Minami Nutrition, Belgium)+2208 mg DHA (MorDHA Mini; Minami Nutrition, Belgium) and a placebo for 6 weeks using a random order, double blind cross-over design (with an 8 week washout period) prior to performing a 60 minute treadmill climb using a weighted backpack. Blood was collected before and at 0, 0.5, 24, and 48 hours post exercise and analyzed for C-reactive protein (CRP), tumor necrosis factor-alpha (TNF- $\alpha$ ), protein carbonyls (PC), oxidized low density lipoprotein (oxLDL), malondialdehyde (MDA), hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), and xanthine oxidase activity (XO). Pre (wk 0) and post (wk 6) blood samples were analyzed for EPA and DHA content.

### Results

Treatment with EPA/DHA resulted in a significant increase in blood levels of both EPA ( $18 \pm 2 \mu\text{mol} \cdot \text{L}^{-1}$  vs.  $143 \pm 23 \mu\text{mol} \cdot \text{L}^{-1}$ ;  $p < 0.0001$ ) and DHA ( $67 \pm 4 \mu\text{mol} \cdot \text{L}^{-1}$  vs.  $157 \pm 13 \mu\text{mol} \cdot \text{L}^{-1}$ ;  $p < 0.0001$ ), while no differences were noted for placebo. Resting levels of CRP and TNF- $\alpha$  were

lower with EPA/DHA compared to placebo ( $p < 0.05$ ). Resting oxidative stress markers were not different ( $p > 0.05$ ). There was a mild increase in oxidative stress in response to exercise ( $p < 0.05$ ), however no interaction effects or condition effects were noted. A condition effect was noted for CRP and TNF- $\alpha$ , with lower values with the EPA/DHA condition ( $p < 0.05$ ). However, no interaction or time effects were noted ( $p > 0.05$ ).

### Conclusion

EPA/DHA supplementation increases blood levels of these fatty acids and results in decreased resting levels of inflammatory biomarkers in trained men, but does not appear necessary for exercise-induced attenuation in either inflammation or oxidative stress in this population. This may be due to the finding that trained men exhibit a minimal increase in inflammation and oxidative stress in response to moderate duration (60 minute), non-eccentric biased exercise.

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