

Poster presentation

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

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from 2009 International Society of Sports Nutrition Conference and Expo
New Orleans, LA, USA. 14–15 June 2009

Published: 31 July 2009

Journal of the International Society of Sports Nutrition 2009, **6**(Suppl 1):P3 doi:10.1186/1550-2783-6-S1-P3

This abstract is available from: <http://www.jissn.com/content/6/S1/P3>

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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 ± 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- α), protein carbonyls (PC), oxidized low density lipoprotein (oxLDL), malondialdehyde (MDA), hydrogen peroxide (H₂O₂), 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- α 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- α , 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.

Acknowledgements

This work was supported in part by Minami Nutrition, Belgium.