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## Can a standard dose of eicosapentaenoic acid (EPA) supplementation reduce the symptoms of delayed onset of muscle soreness?

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## Abstract

### Background

Unaccustomed exercise can result in delayed onset of muscle soreness (DOMS) which can affect athletic performance. Although DOMS is a useful tool to identify muscle damage and remodelling, prolonged symptoms of DOMS may be associated with the over-training syndrome. In order to reduce the symptoms of DOMS numerous management strategies have been attempted with no significant effect on DOMS-associated cytokines surge. The present study aimed to investigate the acute and chronic effects of a 2 × 180 mg per day dose of eicosapentaenoic acid (EPA) on interleukin-6 (IL-6) mediated inflammatory response and symptoms associated with DOMS.

### Methods

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seventeen healthy non-smoking females (age  $20.4 \pm 2.1$  years, height  $161.2 \pm 8.3$  cm and mass  $61.48 \pm 7.4$  kg) were randomly assigned to either placebo (N = 10) or EPA (N = 7). Serum IL-6, isometric and isokinetic (concentric and eccentric) strength, and rating of perceived exertion (RPE) were recorded on four occasions: i-prior to supplementation, ii-immediately after three weeks of supplementation (basal effects), iii-48 hours following a single bout of resistance exercise (acute training response effects), and iv-48 hours following the last of a series of three bouts of resistance exercise (chronic training response effects).

## Results

There was only a group difference in the degree of change in circulating IL-6 levels. In fact, relative to the first baseline, by the third bout of eccentric workout, the EPA group had  $103 \pm 60\%$  increment in IL-6 levels whereas the placebo group only had  $80 \pm 26\%$  incremented IL-6 levels ( $P = 0.020$ ). We also describe a stable multiple linear regression model which included measures of strength and not IL-6 as predictors of RPE scale.

## Conclusion

The present study suggests that in doubling the standard recommended dose of EPA, whilst this may still not be beneficial at ameliorating the symptoms of DOMS, it counter intuitively appears to enhance the cytokine response to exercise. In a context where previous in vitro work has shown EPA to decrease the effects of inflammatory cytokines, it may in fact be that the doses required in vivo is much larger than current recommended amounts. An attempt to dampen the exercise-induced cytokine flux in fact results in an over-compensatory response of this system.

**Keywords:** EPA; IL-6; resistance exercise and Delayed Onset Muscle Soreness

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