

Hormonal and intramuscular adaptations over 50 days of concomitant arachidonic acid supplementation and resistance training.

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ABSTRACT

Prostaglandins are derived from dietary arachidonic acid (AA) and up-regulate recovery mechanisms including inflammation and protein synthesis within skeletal muscle in response to resistance training. The purpose of this study was to determine if 50 days of concomitant resistance training and AA supplementation elicited changes in hormonal and/or intramuscular markers in resistance-trained males. Thirty-one subjects (22.1 ± 5.0 yrs, 86.1 ± 13.0 kg, 178.9 ± 3.4 cm, 18.1 ± 6.4 % body fat) were randomly assigned to a placebo (P: n = 16; 1 g capsulated corn oil/day) or AA group (AA: n = 15; 1 g capsulated AA/day) and were given supplemental protein powder to ingest in order attain an adequate protein intake of 2 g/kg/day while participating in a 4 day/wk resistance training regimen (2 upper/ 2 lower). Fasting blood was taken on days 0, 25 and 50 and muscle biopsies were taken from the vastus lateralis on days 0 and 50. Prostaglandin E2 (PGE2), prostaglandin F2 α (PGF2 α), interleukin-6 (IL-6), free testosterone (fTEST), total testosterone (tTEST) and cortisol (CORT) were assessed with EIA while myosin heavy chain isoform (MHC I, -IIa, -IIx) and mRNA levels were detected using SDS-PAGE and real-time RT-PCR, respectively. Hormonal and MHC data were analyzed by ANOVA with repeated measures while independent t-tests were used to assess changes in MHC mRNA expression. Data are expressed as means \pm SD changes from baseline after 50-days of supplementation for the AA and P groups, respectively. **Statistical trends were found for PGE2 increases (98.5 ± 217 ; P -73.8 ± 273 pg/ml, $p=0.063$) and IL-6 decrements (-28.8 ± 47 ; 52.5 ± 45 pg/ml, $p=0.067$) in the AA group.** A non-significant increase in PGF2 α was also found in the AA group (AA: 45.2 ± 153 ; P: -33.6 ± 139 pg/ml, $p=0.143$). fTEST significantly decreased ($p=0.03$) in both groups over time with no differences among groups (AA: -2.99 ± 6 ; P -2.60 ± 8 pg/ml, $p=0.88$). There was no significant group or main effects for tTEST or CORT. MHC IIa levels significantly increased in both groups over time ($p=0.009$) with no differences among groups (AA: 120 ± 229 ; P 139 ± 262 ng/ml, $p=0.84$). There were no significant time or group x time effects for MHC I or MHC IIx levels. A significant decrement was observed in MHC IIx basal mRNA expression in the AA group (AA: -6.96 ± 24.28 ; P: -4.97 ± 10.88 %, $p=0.02$), while there was no significant time or interaction effects for MHC I or IIa expression. **Results suggest that AA supplementation during resistance training may exert some potentially favorable alterations in an inflammatory marker, fasting hormonal, and gene expression patterns and that additional research is necessary to further examine this hypothesis.**