

Inflammation-Associated RNA Signaling is Reduced Following a Half-Marathon Race when Supplemented with Curcumin and a Pomegranate Extract

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ABSTRACT

Prolonged endurance exercise performances provide a unique model for investigating the combined effects of oxidative stress and eccentric muscle contraction on differential gene expression with nutritional interventions known to blunt inflammation. Dietary polyphenols (i.e. curcumin, pomegranate, etc.) have been shown to reduce exercise-induced inflammation associated mRNA and protein expression with fewer side effects than NSAIDs. **PURPOSE:** To investigate the effect of combined curcumin (500-1000 mg/d; Longvida®) and pomegranate extract (500-1000 mg/d; Pomella®) supplement for 30-days on mRNA expression following a half marathon race. **METHODS:** All protocols were approved by the University IRB committee and participants gave written informed consent. Participants supplemented for 30-days prior to running a half marathon race with either the active (N=XX) or placebo (N=XX). Venous blood samples were collected in PAXgene® RNA tubes 24-h before (PRE) and 4-h after completing a half marathon. After collection, tubes were stored frozen at -80°C until RNA isolation. PAXgene® whole blood was thawed and isolated using PAXgene® Blood miRNA sample processing system (PreAnalytiX) with a QIAcube automation system (Qiagen). Isolated RNA was analyzed using a 594-plex Human Immunology Panel on a NanoString nCounter platform. Data were normalized to housekeeper genes and reported as log₂ fold change. Detailed pathway and interaction analysis was conducted using Nanostring nSolver software to identify RNA that were significantly effected by the supplement. **RESULTS:** Analysis revealed significant down regulation of pro-inflammatory associated mRNA at 4-h post-race with supplementation compared to control. **CONCLUSION:** Combined curcumin and pomegranate extract supplementation altered expression of inflammation associated mRNA prior to and following a half marathon race. Based on these findings, it appears that curcumin and pomegranate extract supplementation may positively affect short-term inflammatory response and recovery in endurance athletes and recreationally active individuals participating in half marathon races. More research is needed to determine how to best use these as part of a long-term training plan.

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