Effect of Branched Chain Amino Acids on Salivary Cortisol Levels During Endurance Exercise

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Background
Branched Chain Amino Acids (BCAAs) are often used as dietary aids by endurance athletes for the purposes of delaying fatigue, improving endurance, and promoting post-exercise recovery. Efficacious doses of BCAAs, as reported in the scientific literature, are typically in excess of 10g, yet few commercial products provide such dosing.

Purpose
We evaluated the effects of a commercially available BCAA-based product providing a specific blend of 3 parts leucine (900mg and 450mg/dose), 1 part isoleucine (300mg and 150mg/dose), and 1 part valine (300mg and 150mg/dose) on salivary cortisol levels. Thus, supplementation provided either 1,500mg or 750mg of total BCAAs, in a 3:1:1 ratio of leucine:isoleucine:valine, per dose.

Methods
We recruited 32 endurance athletes to receive 4 doses of BCAAs over a 24-hour period at a low dose (L, 750mg/dose, N = 11), a high dose (H, 1,500mg/dose, N = 11), or a placebo (P, N = 10). Subjects were participants in a 24-hour mountain biking event and consumed the supplement following the completion of each of 4 laps (14.91 miles). Total BCAA dosing over the 24h period was 6g (H) or 3g (L). Saliva samples were collected before and after each lap for analysis of cortisol as an index of exercise stress and recovery.

Results
Both H and L showed reduced cortisol exposure (0.509$\pm$0.627ug/dL and 0.565$\pm$0.478ug/dL, respectively) versus P (0.982$\pm$0.972ug/dL, both $P < 0.05$). Of interest, was the finding that while L reduced cortisol exposure by 42.5% compared to placebo, H was only slightly more effective (48.2%), and not statistically so ($P = 0.64$ L vs H).

Conclusions
These results demonstrate that as little as 750mg/dose of BCAAs in a 3:1:1 ratio (total dose of 3g over 24h) can reduce cortisol exposure during intense endurance exercise.