

Novel Energy Drink Improves Mood and Raises Blood Pressure, but has No Effect on Cardiac QTc Interval or Rate-Pressure Product in Young Adult Gamers

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ABSTRACT

Novel energy drink formulations have been introduced to the market that are purported to have nootropic effects - including improving mood. Despite their rapidly growing popularity, especially among video gamers, there is minimal evidence supporting their efficacy or establishing their cardiovascular safety profiles. **PURPOSE:** We conducted a randomized, double-blind, placebo-controlled, crossover trial to investigate the effects of acute consumption of a non-caloric, novel energy drink (NED) containing 200 mg caffeine, citicoline, tyrosine, B-vitamins, and carboxylic acids on mood and cardiovascular safety outcomes. We hypothesized that NED would improve mood without significant adverse cardiovascular effects when compared to placebo. **METHODS:** Forty-five healthy young adults who routinely play video games (37M, 8F; mean \pm SD, age = 25 ± 6 y) each completed two experimental study visits in randomized order where they consumed either NED or a placebo matched for volume, calories, taste, appearance, and mouthfeel. Resting systolic and diastolic blood pressure (SBP and DBP) and an electrocardiogram (ECG) were obtained from each participant after a 10-min quiescent period prior to and 45 minutes after consumption of NED or placebo. Resting heart rate (RHR) and corrected QT interval length (QTc) were derived from the ECG. Rate-pressure product (RPP) was determined as the product of HR and SBP. Mood was assessed using the Profile of Mood States at post-consumption after BP and ECG assessments. Paired t-tests or signed ranked tests (for non-normally distributed data) were used to examine between-condition differences in mood states, whereas 2 (condition) \times 2 (time) ANOVAs were used to examine SBP, DBP, QTc, and RPP. **RESULTS:** Change scores are presented as mean absolute change \pm 95% confidence interval. Relative changes are provided for mood data. Acute NED consumption improved fatigue-inertia (-1.4 ± 1.0 a.u. [+36%]; $p = 0.004$), vigor-activity ($+2.4 \pm 1.2$ a.u. [+33%]; $p < 0.001$), and friendliness ($+0.7 \pm 0.7$ a.u. [+7%]; $p = 0.04$), without adverse effects on tension-anxiety, confusion-bewilderment, or depression-dejection (all $p \geq 0.27$). RHR decreased from pre- to post-beverage consumption, and this decrease was greater following NED than placebo consumption (-6.0 ± 2.8 vs. -2.6 ± 1.4 bpm, $p = 0.017$). SBP ($+3.7 \pm 2.0$ vs. -0.4 ± 2.0 mmHg; $p = 0.002$) and DBP ($+3.7 \pm 1.7$ vs. -0.04 ± 1.4 mmHg; $p = 0.003$) increased following NED vs. placebo; however, RPP decreased independent of condition (-386.0 ± 229.0 ; $p = 0.03$), and there was no effect of beverage consumption on QTc ($p = 0.44$). **CONCLUSION:** Acute NED consumption improved mood states related to vigor, fatigue, and friendliness without affecting tension-anxiety, depression, or confusion in young adult gamers. While NED consumption produced mild increases in SBP and DBP, there were no effects on either QTc or RPP. Thus, overall, NED consumption produces mood-enhancing effects without markedly influencing cardiovascular safety outcomes.