

Caffeine Levels in Energy Drinks: Health and the Implication for Cardiovascular and Neurological Health Systems in Pediatrics and Young Adults

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INTRODUCTION

- Energy drinks contain several amino acids, caffeine, and electrolytes.
- Many of the consumers of energy drinks are compromised by pediatrics and young adults. (Heckman et al., 2010)
- Energy drinks are comprised of high levels of caffeine which range from 80-350 mg of caffeine per serving.
- This large amount of caffeine in the energy drinks studied are found to contribute to the negative health implications on the cardiovascular and neurological systems in those who are still developing, pediatrics and young adults.
- The implications of caffeine on the cardiovascular system includes increases of blood pressure and heart rate
- The implications of caffeine on the neurological system it may inhibit dendritic growth and reduces cerebral blood flow which may lead to brain damage.

OBJECTIVE

Analyze the detrimental effects of caffeine in energy drinks.

CARDIOVASCULAR RESULTS

- Caffeine induces a release of norepinephrine and epinephrine which increases heart rate and blood pressure.
- Caffeine induces a QT interval prolongation.
- Caffeine promotes calcium release

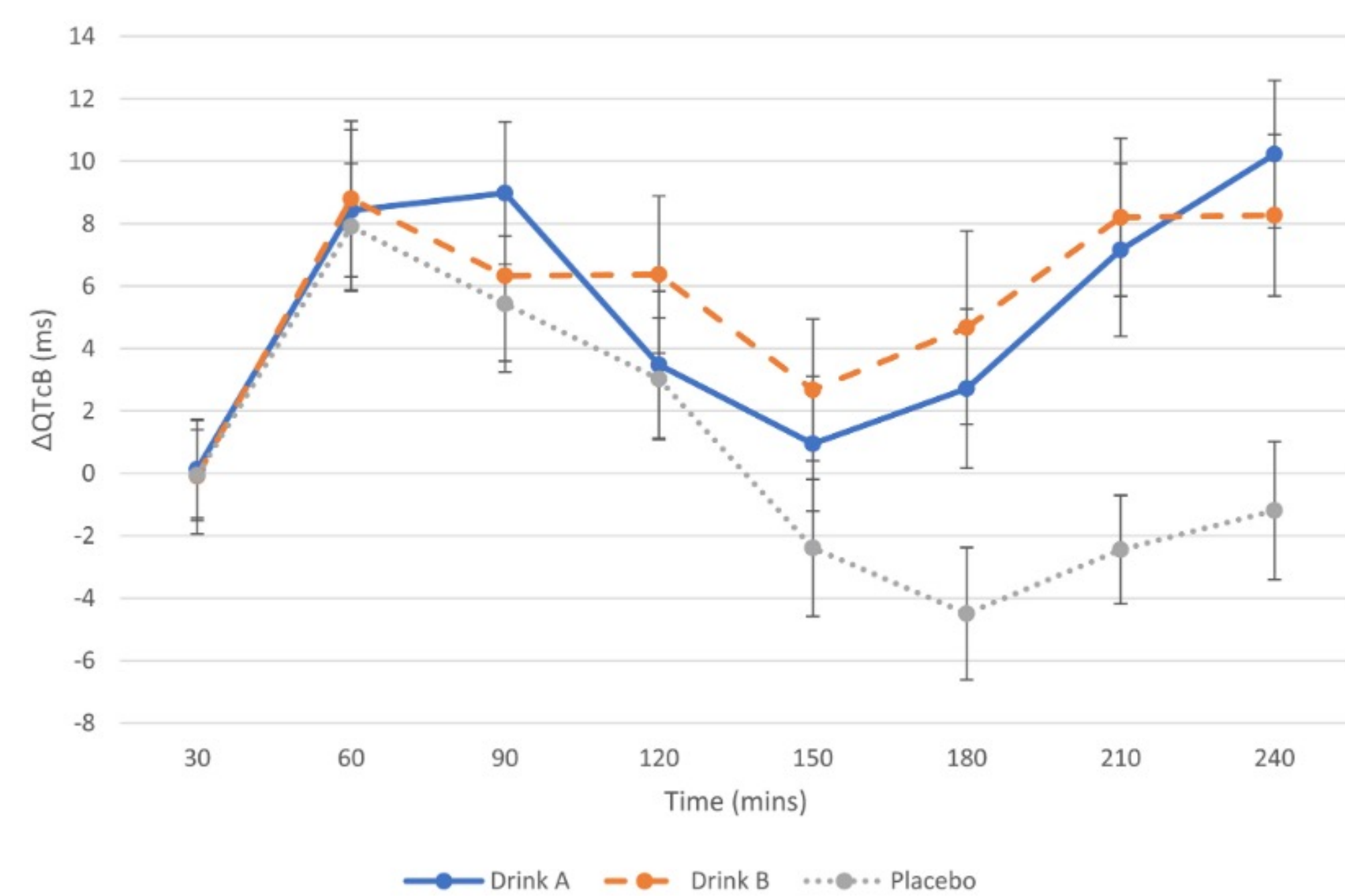


Figure 1. QT prolongation over time in placebo-controlled study. Shah SA, Szeto AH, Farewell R, et al.

NEUROLOGICAL RESULTS

- Dendritic growth is inhibited with both caffeine and taurine present.
- Caffeine inhibits the growth of Map-2 positive neurons.
- The treatment of both caffeine and taurine reduces the proliferation of immature oligodendrocytes and decreases myelination capacity

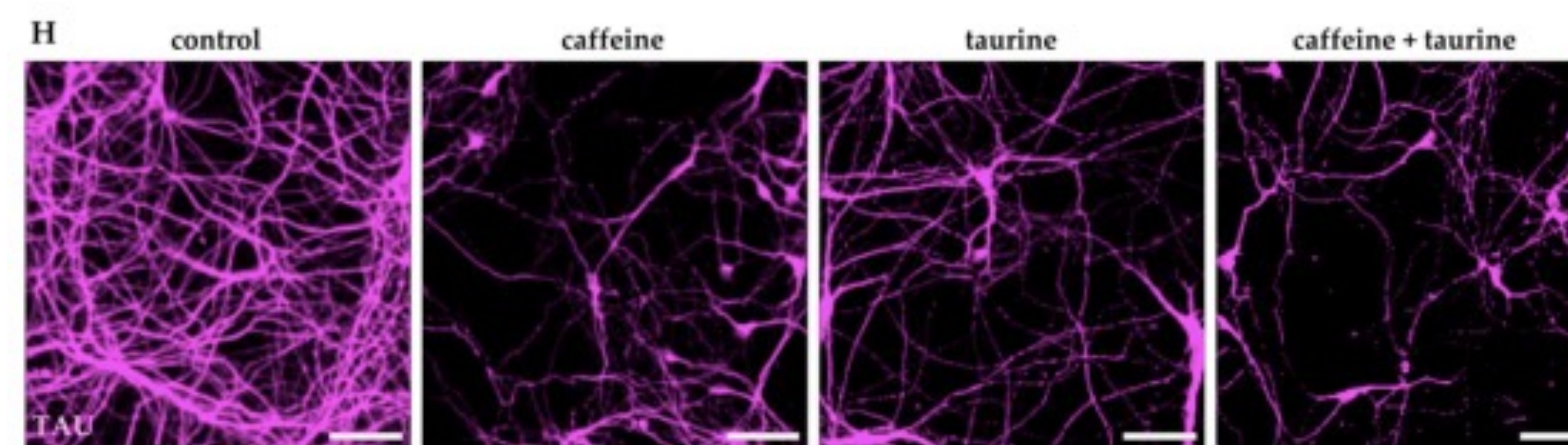


Figure 2. Dendritic growth in the presence of caffeine and taurine with a control group. Serdar M, Mordelt A, Müser K, et al.

FUTURE DIRECTIONS

- Investigate the vasoconstriction that caffeine initiates by releasing more of the neurotransmitter norepinephrine
- Examine the coupling effects of caffeine and the other ingredients that are present in popular energy drinks.
 - Analyze effects on different races and genders.
- Further investigation in comparison to age groups of pediatrics ages compared to 'fully developed' adults.

CONCLUSION

There is sufficient evidence to prove that caffeine is a contributor in energy drinks to the overall detrimental effects on the pediatric and young adult cardiovascular and neurological growth development.

Caffeine's Cardiovascular System Implications

- Promotion of calcium release
- Prolongation of QT interval

Caffeine's Neurological System Implications

- Reduction of cerebral blood flow

Caffeine and Taurine's Coupled Neurological Effects

- MAP-2 positive neurons reduced.
- Reduction in dendritic growth.

METHODS

- Analyzing primary articles about effects of high levels of caffeine on youth development.
- Analyzing articles about regulation on caffeine levels in energy drinks.
- Researching the impacts that caffeine and taurine has on the cardiovascular system in youths.
- Researching the impacts that caffeine and taurine has on the neurological system in youths.

REFERENCES

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