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Letter to editor

Potential negative effects of caffeine in athletes

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Summary. Letter related to "Rahimi MR, Khabiri P, Faraji H. Effects of caffeine ingestion on resistance exercise-induced apoptosis in athletes: A randomized, double-blind, placebo-controlled, crossover study. PN 2Jul.2018 [cited 20Dec.2018];20(4):563-9."

Key word: caffeine, energy drinks, athletes

Dear Editor,

We have read with great interest the paper "Effects of caffeine ingestion on resistance exercise- induced apoptosis in athletes: A randomized, double-blind, placebo-controlled, crossover study" by Rahimi MR and coworkers (1) and we found his manuscript of importance with a view to clinical prevention. This study examined the effects of oral caffeine ingestion on biomarkers of apoptosis including Bax and Bcl-2 during strenuous Resistance Exercise in resistance trained men. Their results suggest that acute caffeine intake attenuated exercise induced apoptosis in resistance trained men, which was confirmed by attenuated percentage change of Bax/Bcl-2 ratio in the caffeine condition.

With reference to the findings reported in the paper, we would like to make the following contribution to the discussion.

Athletes are habitual consumers of highly caffeinated beverages to combat fatigue and improve performance, due to the well known effect of caffeine on muscle and on performance. Other than the positive effects reported in the paper by Rahimi and coworkers we have to consider the potential negative action of caffeine on arrhythmogenesis. Commercial energy drinks contain different quantity of other energetic substances such as guarana (containing guaranine, similar to caffeine), taurine, and gingko biloba (2, 3). Energy drinks have potential arrhythmogenic effect. This pro-arrhythmic effect could be dangerous in athletes due to the very high adrenergic activity developed during intense exercise (4). In previous studies we reported the development of atrial fibrillation in young subjects after acute ingestion of energy drinks mixed with alcohol during recreational activities (5, 6). Accordingly, several reports referred about episodes of arrhythmias induced by energy drinks consumption, sometimes associated with binge ingestion of alcohol (7). We suppose that the combined effect of highly dosage of caffeine and other stimulating substances included in energy drinks (i.e. taurine) can trigger the onset of arrhythmias. The reaction of individuals to caffeine consumption is variable. Caffeine, in fact, stimulates both the central and the peripheral nervous systems affecting the cardiocirculatory and breathing systems. Because of this stimulant effect, there is concern that caffeine might increase arrhythmic risk (2, 7). However, moderate doses of caffeine are well tolerated in patients with arrhythmia as well as in athletes. Caffeine may mediate AF by resulting in neurohormonal stimulation and sympathetic activation and the effects could be enhanced in nonhabitual caffeine consumers (7). It is plausible that only some subjects are

susceptible to developed arrhythmias during binge ingestion of EDs and alcohol and that alcohol support the development of side effects of EDs through unknown mechanisms (6, 7).

Further studies are needed in order to evaluate the effects of high caffeine consumption in athletes with a specific focus on arrhythmogenesis.

We agree with Dunican and coworkers that there is a need for a strategic approach to the use of caffeine in athletes.

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