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Meeting Abstract

Effect of the caffeine on decrease in body weight in adults overweight

Efecto de la cafeína sobre la baja de peso en adultos con sobrepeso

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Caffeine is a stimulant alkaloid of central nervous system (CNS) that belongs to the family of xanthine. It is found naturally in various plants such as guarana, green tea, yerba mate, coffee beans, among others (1), and is possible to find it artificially in products developed by the food industry (e.g. drinks, energy, supplements), oriented to obtain benefits from its various properties (2).

When it is consumed in doses not exceeding 200 mg/day (safe consumption level) is unlikely to observe reactions that may cause some health problems. However, it is need to have some degree of caution when this dose is exceeded due to that i) is a substance easily accessible due their lower economic cost, and ii) it could generate certain drawbacks in the body related to nausea, vomiting, tachycardia, among others (1)

Caffeine generate diverse effects in the body are associated with increased wakefulness, improved cognitive ability, decreased sense of fatigue, fat oxidation, increased thermogenesis, among others (3-5). However, for a couple of decades it has been widely used as a supplement to reduce body weight and fat mass (3,4).

The main implication in body composition is due to its effects on energy metabolism. Caffeine is a powerful stimulating on the CNS, is able to increase the availability of both fatty acid (FA) and glucose in plasma, from degradation triglycerides and glycogen, respectively (6). For this reason, this alkaloid plays an important role as a component of various nutritional supplements and programs to reduce body weight and fat mass loss (7).

The scientific literature reinforces the above-mentioned, but it is noteworthy that most of the studies (linked to loss of body fat mass) have been performed in athletes or people intervened with a nutritional and/or exercise plan (6). The practice of physical exercise generates a significant increase in metabolic rate and energy expenditure, an increase in the use of FA and glycogen (6,8). This scenario (energy availability and negative energy balance) promotes both

the reduction of the fat component, but also a reduction in muscle volume due to loss of glycogen and liquid intracellular (1 g glycogen is stored with 3gr water) (4).

Considering the above, the following question arises, Is it possible that occurs a variation in body composition (mainly a decrease in the percentage of fat mass) in overweight or obese who take a supplement with caffeine but do not change their eating habits and physical activity?

To answer this question research, it was conducted a systematic review with meta-analysis.
A structured search was performed in PubMed for studies that have been published over the past 20 years, studies should be: clinical trials, randomized, controlled (control with or without placebo group), and that involved caffeine supplementation. Individuals should be sedentary, obese/overweight, and during the course of the study should not change their diet or their level of physical activity behaviors. Studies evaluating fat mass, muscle mass and/or body weight were included. Effect size (ES) was calculated through Cohen's d with the parameters selected. $p < 0.05$ value as statistically significant was established.

The results indicate that occurs a significant loss of weight (ES: -2.79, CI -4.4 to -1.17; $p = 0.00$), but this is not only attributable to a decrease in mass fat (ES: -0.24, CI -1.11 to 0.64; $p = 0.60$). Therefore, to determine the actual magnitude of the effect of caffeine on the decreased fat mass, would be highly recommended that future studies evaluating the same time the variation that occurs in muscle mass and body weight. This is mainly because the caffeine promotes glycogenolysis and diuresis, generating a significant effect over hydration levels and muscle volume (2-6).

Besides the above, apparently the effectiveness of caffeine may be influenced by other factors such as the own components of the same plant. For example, the epigallocatechin gallate is present in green tea and was shown to significantly decrease fat absorption (9).

While it is undeniable the effect of caffeine on body weight and fat mass in people who participate in an exercise program and/or feeding regime, their results seem inconsistent in people taking a supplement with caffeine and who do not modify its lifestyle (physical activity and nutrition). It is recommended that future studies examining the effects of caffeine supplementation on various components within the same study, such as fat mass, muscle mass, weight and body fluids, among others.

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