CONTRIBUTION OF EXOGENOUS CITRATE TO THE METABOLIC DISBALANCE IN OBESITY

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Introduction: Overweight and obesity have become an epidemic worldwide and is linked to sedentary lifestyle and consumption of processed foods and drinks. Citrate is the most widely used additive in food industry. On the other hand, citrate is also a metabolite that is at the intersection between carbohydrate and lipid metabolism. The fate of exogenous citrate once ingested is largely unknown, but cytosolic citrate is readily metabolized by ATP:citrate lyase, producing acetyl-CoA, the metabolic precursor of endogenously-produced lipids and cholesterol. Objectives: We therefore reasoned that the citrate ingested in processed food and drinks could contribute to increase post-prandial fat production and weight gain. Materials and methods: To test our hypothesis, we gave mice citrate with or without saccharose in their drinking water. We then monitored their weight gain as well other metabolic parameters. Discussion and results: Our results show that mice receiving citrate or citrate plus saccharose did not present increased weight gain or increased weight of liver or adipose tissues. Moreover, cholesterol profiles (total cholesterol, LDL and HDL) were comparable in all groups. However, fasting glycemia and adipose tissue TNFα were slightly but significantly increased in mice receiving citrate and saccharose. Our results therefore suggest that citrate consumption may predispose mice to metabolic alterations that contribute to the development of insulin resistance and adipose tissue inflammation. Conclusion: Thus, high citrate consumption may be a hitherto ignored causative agent in obesity epidemics.

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