

## Chocolate Consumption: Benefits in Cardiovascular Disease

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*Editorial related to the article: Association Between Chocolate Consumption and Severity of First Infarction*

The major risk factors for cardiovascular diseases (CVDs) are directly related to endothelial dysfunction, reduced bioavailability of nitric oxide, vasoconstriction, oxidative stress, and inflammation.<sup>1</sup> Several studies have been stimulating the use of non-pharmacological strategies to reduce these risk factors. In this sense, some nutrients and bioactive compounds in foods have demonstrated beneficial effects. Chocolate, for example, has gained attention for its content of cocoa, a polyphenols-rich food, and flavanols.<sup>2</sup>

In the paper entitled “Association between chocolate consumption and severity of first infarction”, Duarte et al.,<sup>3</sup> found that patients with the first acute myocardial infarction (AMI) who consumed chocolate, showed a low Syntax index, indicating low complexity of coronary lesions. The authors also demonstrated a negative correlation between Syntax and the amount of chocolate consumed, and an association between chocolate consumption and absence of systemic arterial hypertension and diabetes. The cardioprotective effects of polyphenols present in chocolate have been studied, and a series of results supported the protective effects of cocoa and chocolate intake on CVDs. These protective effects are associated with vasodilation, improvement of endothelial function, platelet aggregation, increase in HDL and reduction in LDL levels.<sup>4</sup>

Recently, studies have demonstrated the relationship between gut microbiota and CVD, and it would be interesting to determine the possible effects of cocoa polyphenols on these microbiota. Flavanols are absorbed in the small intestine, metabolized in the liver and excreted in the urine.<sup>5-8</sup> A study conducted in healthy individuals showed that consumption of a high-cocoa flavanol beverage significantly increased the growth of *Lactobacillus* spp. and *Bifidobacterium* spp. in comparison to a low cocoa flavanol drink,<sup>6</sup> promoting anti-inflammatory effects in these individuals.

Obesity is one of the main risk factors for CVDs. Experimental studies revealed that cocoa could reduce visceral adipose tissue and synthesis of fatty acids, enhance thermogenesis and appetite response, and increase the expression of adiponectin and glucose transporter.<sup>4,9-11</sup>

In conclusion, polyphenols present in chocolate seem to be a promising therapeutic strategy for CVD patients due to its activity in inflammatory modulation, endothelial dysfunction, gut microbiota, lipid status and obesity. In my point of view, further clinical studies are necessary to compare the best sources of polyphenols, chocolate or cocoa, and to determine the most effective way to offer these bioactive compounds to patients.

### Keywords

Cardiovascular Diseases / mortality; Myocardial Infarction / physiopathology; Flavonoids; Polyphenols; Chocolate.

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