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Camellia sinensis in the form of green and black tea for the primitive prophylactive effect on cardiovascular disease

Mohammadjavad Norouzi[1], Pardis Mohammadi Pour[2] ,Sedigheh Asgary[3]

[1] Applied Physiology Research Center, Isfahan University of Medical Sciences; [2]Phytochemistry Research Center, Shahid Beheshti University of Medical Sciences, 1991953381 Tehran, Iran; [3]Isfahan Cardiovascular Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran

***Corresponding Autho**r: Sedigheh Asgary, Isfahan Cardiovascular Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran

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Tea is one of the most consumed beverages in the world that is generated by the leaves of *Camellia sinensis*. *C. sinensis* exhibited remarkable antioxidative, antimicrobial, anti-inflammatory, antihypertensive, anticarcinogenic, cholesterol-lowering, neuroprotective, and thermogenic properties [1]. Tea can be effective in improving cardiovascular risk factors in patients with cardiovascular disease (CVD) by reducing cholesterol, triglycerides, and blood pressure [2]. CVDs are the major reason of an estimated 17.9 million individuals' death globally each year. CVDs is a widespread term for circumstances impacting the heart and blood and include strokes, cerebrovascular disease, coronary heart disease, rheumatic heart disease, peripheral arterial disorder, aortic disease, high blood pressure and other conditions [3]. Among the various reason and risk factors of CVD, one of the main reasons is Atherosclerosis [4]. It is noteworthy to highlight that the main focus of nutrition science is on the impact of essential nutrients in preventing disease in particular CVDs. These nutritional strategies are not only crucial to promote the health, but also show prophylactic impact on the global no communicable diseases. Based on the epidemiological studies, diet is one of the main parameters, that is more accessible to modify than other factors [5]. Tea, as one of the most consumed drinks among people in the society, can affect the health of the heart and blood vessels [6].

Epidemiological, observational, and experimental evidence have illustrated that the two main types of tea, green and black tea consumption might improve cardiovascular function [7]. *C. sinensis* is a rich dietary source of flavonoids, terpenes, phenylpropanoids/benzenoids and volatile fatty acid derivatives. Isolated flavonoids have been demonstrated

the inhibition in the atherosclerosis development in *in vivo* models [8-10].

Based on clinical trials, flavonoids, particularly in *C. sinensis* and other herbs like cocoa, have a direct effect on lowering blood pressure [10-13]. Growing evidence of randomized-controlled clinical trials proposed that flavonoids may be effective for the health of vascular system, in particular concerning the prophylactic effect for endothelial dysfunction [14-17]. The phenolic compounds in this herb also showed the inhibitory activity against platelet activation [18]. Therefore, understanding the effects of flavonoids on the vascular system is critical to comprehend their impact on health (Figure 1) [19].

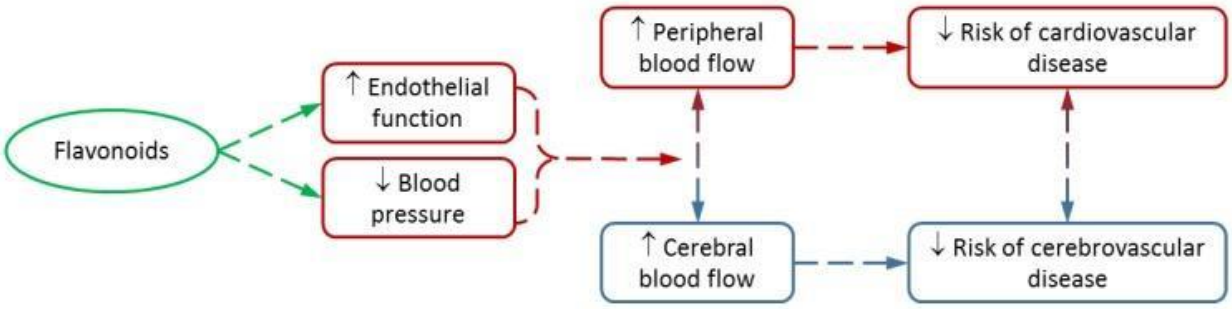

Fig.1: The flavonoids impact on vascular function and their involvement in health condition.

C. sinensis contains a high amount of vitamins and minerals. Of five cups/day, which is equal to 5% to 10% of a person's daily intake of niacin, riboflavin, pantothenic acid and folic acid, it also contains 45%, 25% and 5% of the daily requirement of manganese, potassium and magnesium, respectively [20]. Moreover, by consuming three or more cups of tea/day, the risk of myocardial infarction is reduced by 11% [21].

According to the published articles, changing the lifestyle and daily consumption of green tea and black tea can prevent CVD to some extent and reduce mortality caused by CVD [22].

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