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# Coffee and caffeine consumption in women affected by hypertension

Anna Vittoria Mattioli<sup>1</sup> · Matteo Ballerini Puviani<sup>2</sup> · Alberto Farinetti<sup>1</sup>

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Dear Editor,

We have read with great interest the paper “Coffee consumption and risk of hypertension: a systematic review and dose–response meta-analysis of cohort studies” by Xie et al. [1] and we found their conclusion of importance with a view to clinical prevention. Authors concluded that their meta-analysis provides quantitative evidence that consumption of coffee was inversely associated with the risk of hypertension in a dose–response manner.

With reference to the findings reported in the paper, we would like to make the following contribution to the discussion. Recently, we evaluated 650 healthy women at premenopausal age, within this group we selected 237 women treated for hypertension (age range 45–54 years).

Women were categorized according to adherence to Mediterranean Diet, and group of food and beverages (fruit, vegetables, cereals, wine, and coffee) were singularly analysed. Caffeine intake was evaluated: One cup of espresso coffee included 90 mg of caffeine, one cappuccino = 110 mg of caffeine, one cup of American coffee = 160 mg, one can of cola soda = 42 mg, one can of energy drink = 80–120 mg, and one chocolate snack = 6 mg [2]. All women underwent evaluation of ABI index, a biomarker of pre-clinical atherosclerosis [3]. Local Ethics Institutional Board approved the protocol. Patients signed an informed consent. We found that coffee intake was higher in women in the high quartile of adherence to Mediterranean Diet. Hypertensive women that had high coffee consumption (>4 cups/day) had less frequently pre-clinical atherosclerosis

compared to women that consumed 1 cup/day or less [4]. We also found that the intake of chocolate snacks and bars increased caffeine intake from 150 ± 30 mg/day from coffee to 200 ± 50 mg/day from coffee plus chocolate.

Chocolate is a source of antioxidants leading to a beneficial effect. It is well known that the Mediterranean Diet is characterized by high intake of antioxidants, and, in our population, coffee and chocolate represents a source of antioxidants with an impact on total antioxidant intake [2, 3, 5, 7]. Coffee included several compounds and the bioavailability and the distribution of each compound and its metabolites contribute to coffee mechanisms of action. The mechanism of cardiovascular prevention is probably not related to caffeine but to one or more of the other compounds of coffee, i.e., chlorogenic acid, cafestol. Similarly, chocolate exerts beneficial effects on vessels [7]. A previous paper confirms this data in women, Rhee and coworkers found that caffeinated coffee, decaffeinated coffee, and caffeine are not risk factors for hypertension in postmenopausal women [8]. This could help to explain [9] the results from Xie et al. [1]. We can conclude that in our population of women living in the Mediterranean Area, the intake of coffee and caffeine do not increase significantly blood pressure. However what we found is merely an association and there are many confounders. The main confounder is the presence of the healthy “Mediterranean” diet and we cannot attribute the findings of our study to the caffeine intake alone.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest. Informed consent was obtained from all individual 66 participants included in the study.

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✉ Anna Vittoria Mattioli  
annavittoria.mattioli@unimore.it

<sup>1</sup> Department of Surgical, Medical and Dental Department of Morphological Sciences related to Transplant, Oncology and Regenerative Medicine, University of Modena and Reggio Emilia, Modena, Italy

<sup>2</sup> Istituto Nazionale per le Ricerche Cardiovascolari U.O. di Modena, Modena, Italy

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