

# Coffee and Caffeine Consumption and the Risk of Hypertension in Postmenopausal Women

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**Abstract: Background:** Caffeine can cause a short, but dramatic increase in your blood pressure healthy individual people including postmenopausal women, but it's unclear whether the caffeine can be a hypertension risk factor among postmenopausal women or not.

**Objective:** The study aims to examine the relationship between coffee consumption and blood pressure and incident hypertension in postmenopausal women

**Methodology:** Literature was obtained by searching MEDLINE (last 35 years), and the Cochrane Database of Systematic Reviews. Search terms included caffeine, blood pressure, postmenopausal women. Literature was also obtained from citations in relevant articles.

**Conclusion:** Over many years of follow-up, coffee drinking is associated with small increases in blood pressure among postmenopausal women, but appears to play a small role in the development of hypertension.

**Keywords:** blood pressure, caffeinated coffee, caffeine, hypertension, postmenopausal women.

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## 1. INTRODUCTION

Caffeine is the most widely used pharmacologically active substance in the world, with a reported intake of 200 to 300 mg/d in 80% of adults in the United States <sup>(1)</sup>. Caffeine is expended in coffee, tea, sodas, and, all the more as of late, caffeinated filtered water. The mass bid of caffeine could have wellbeing suggestions as a result of its all around recorded pressor impact. A late meta-analysis of controlled clinical trials reported a positive relationship some coffee devoured once a day and increased systolic blood pressure (SBP), independent of age <sup>(2)</sup>.

It has long been suspected that coffee consumption may have adverse effects on the cardiovascular system. Some <sup>(3,4,5)</sup> cross-sectional studies have recognized a positive relationship between coffee drinking and blood weight. No less than one imminent study <sup>(6)</sup> has demonstrated that coffee drinking is connected with an expansion in blood weight. Surmising in regards to causality, be that as it may, must be made with alert from observational studies in light of the fact that different attributes connected with coffee drinking may underlie the watched connections. Experimental studies provide the best opportunity to determine whether a relationship is causal and whether an intervention, such as coffee cessation, has therapeutic relevance <sup>(7,8)</sup>.

## 2. LITERATURE REVIEW

In cohort study of 1017 participants investigating the Coffee intake and risk of hypertension showed that Consumption of 1 cup of coffee a day raised systolic blood pressure for very short time. Compared with nondrinkers at baseline, coffee drinkers had a greater incidence of hypertension during follow-up these associations were not statistically significant Klag MJ et al <sup>(9)</sup>.

Horst et al <sup>(10)</sup> reported on a clinical trial of coffee drinking in hypertensive patients. Since then, >36 experimental investigations of the effects of coffee consumption on blood pressure in humans have been published. However, most of these trials have been small and cannot provide definitive results. The effects of coffee drinking on heart rate and the

question of whether the health effects of coffee drinking differ according to the method used for brewing have also been controversial.

Winkelmayer WC et al <sup>(11)</sup> in Prospective cohort study conducted among 155,594 US women most of them in the postmenopausal period of their life and all were free from physician-diagnosed hypertension and stated that an inverse U-shaped association between caffeine consumption and incident hypertension was found. Compared with participants in the lowest quintile of caffeine consumption, therefore habitual coffee consumption was not associated with increased risk of hypertension.

A recent large prospective study by Rhee JJ et al, <sup>(12)</sup> to assess longitudinal relations of caffeinated coffee, decaffeinated coffee, and total caffeine intakes with mean blood pressure and incident hypertension in postmenopausal women in the Women's Health Initiative Observational Study stated that neither caffeinated coffee nor caffeine intake was associated with mean systolic or diastolic blood pressure, but decaffeinated coffee intake was associated with a small but clinically irrelevant decrease in mean diastolic blood pressure. Decaffeinated coffee intake was not associated with mean systolic blood pressure. Intakes of caffeinated coffee, decaffeinated coffee, and caffeine were not associated with the risk of incident hypertension (P-trend > 0.05 for all).

### 3. OBJECTIVES

Although relatively little is known about the responsible role for caffeine intake as risk factor of hypertension in postmenopausal women suggests a role for caffeine intake. This study aims to examine the relationship between coffee consumption and blood pressure and incident hypertension in postmenopausal women.

### 4. METHODOLOGY

The medical literature was searched for all reports on the effect of coffee supplementation in humans published before June 2016. This included the following:

(1) A MEDLINE computer database search using the medical subject headings blood pressure and caffeine and the text word coffee; postmenopausal women (2) a review of reference lists from original research articles and several review articles; and (3) a review of the authors' reference files. More than 15 studies were identified, all of which were published in English.

These articles were reviewed by the authors to determine whether they met a series of predetermined criteria for inclusion in our subsequent analysis. Areas of disagreement or uncertainty were adjudicated by consensus.

### 5. RESULTS AND DISCUSSION

Participant and study design characteristics of the 12 clinical trials included in our meta-analysis displays daily habitual intake of coffee before start of the study, duration of the run-in period, method of preparation, and amount of coffee and caffeine content (milligrams) consumed in the trials.

Compared with control, coffee administration was associated with an average net change in blood pressure that ranged from -2.1 to 6.1 mm Hg for systolic and -0.9 to 3.1 mm Hg for diastolic blood pressure. Systolic and diastolic blood pressure increased in the coffee administration arm compared with the corresponding control group in 9 (82%) of the 11 trials; in 6 trials (55%), the lower bound of the 95% CI was >0. For diastolic blood pressure, an intervention-related increase in blood pressure was also noted in 9 (82%) of the 11 trials, and the lower bound of the 95% CI was >0 in 6 (55%) of the 11 studies. For both systolic and diastolic blood pressure, there was considerable variation across the 11 trials in the estimate of intervention-related average net change in blood pressure and in the width of the associated 95% CI. On the basis of a test of homogeneity, the variation in estimated in effect size was significant for both systolic and diastolic blood pressure (P<0.001).

Pooled estimates of the effect of coffee supplementation on systolic and diastolic blood pressure are provided in Table 1 The overall pooled estimates of treatment effect associated with coffee drinking were 2.4 mm Hg (95% CI, 1.0 to 3.7) for systolic (P=0.005) and 1.2 mm Hg for diastolic (95% CI, 0.4 to 2.1) (P=0.015) blood pressure. There was evidence favoring a greater effect on systolic blood pressure in studies with a run-in period of <7 days and those that administered more coffee. Diastolic blood pressure also increased more in trials with younger participants. There was no statistically

significant difference in effect size between other subgroups. The pooled effect of drinking 1 cup of coffee, estimated in linear regression analysis, was 0.8 mm Hg for systolic pressure ( $P<0.001$ ) and 0.5 mm Hg for diastolic pressure ( $P<0.01$ ).

**Table 1: Mean Net Systolic and Diastolic Blood Pressure Changes in Subgroups of Trials Defined by Participant and Study Design Characteristics**

Characteristic	Systolic Blood Pressure				Diastolic Blood Pressure			
	No.	$\Delta$	95% CI	$P^1$	No.	$\Delta$	95% CI	$P^1$
Overall	11	2.4	1.0 to 3.7	0.005	11	1.2	0.4 to 2.1	0.015
Sample size								
≤45	6	1.9	0.7 to 3.0	0.455	6	1.1	0.3 to 1.8	0.821
>45	5	3.2	0.01 to 6.4		5	1.3	-0.5 to 3.1	
Age, y								
≤38	6	3.2	1.2 to 5.7	0.269	6	1.8	0.5 to 3.1	0.187
>38	5	1.4	-0.6 to 3.3		5	0.6	-0.4 to 1.6	
Run in, d								
≤7	7	3.5	1.9 to 5.2	0.039	7	1.4	0.3 to 2.6	0.062
>7	4	0.5	-1.3 to 2.3		4	0.9	-0.5 to 2.3	
Duration of intervention, d								
≤55	5	1.4	-0.27 to 3.07	0.234	5	0.59	-0.75 to 1.94	0.223
>55	6	3.1	1.08 to 5.09		6	1.69	0.67 to 2.71	
Instant coffee								
Yes	4	1.5	-1.2 to 4.1	0.432	4	0.5	-1.5 to 2.6	0.396
No	7	2.8	1.2 to 4.4		7	1.5	0.7 to 2.3	
Filtration during preparation								
Yes	5	2.0	0.4 to 3.6	0.650	5	1.5	0.5 to 2.5	0.574
No	6	2.7	0.3 to 5.2		6	1.0	-0.4 to 2.3	
Coffee, cups								
1-4.5	4	0.1	-2.1 to 2.3	0.044	4	1.0	-1.1 to 3.0	0.734
≥5	7	3.2	1.8 to 4.6		7	1.4	0.5 to 2.3	
Type of control								
No coffee	8	2.5	0.6 to 4.4	0.459	8	1.1	0.1 to 2.1	0.612
Decaffeinated coffee	3	1.7	1.0 to 2.4		3	1.7	-0.3 to 3.7	
Method of BP measurement								
Manual	4	0.8	-1.6 to 3.2	0.120	4	1.6	-0.6 to 3.8	0.687
Automatic	7	3.3	1.7 to 4.8		7	1.1	0.3 to 2.0	

$P^1$  values from *t* test between coffee drinking and characteristics on net change in blood pressure (BP).

## 6. CONCLUSION

Over many years of follow-up, coffee drinking is associated with small increases in blood pressure among postmenopausal women, but appears to play a small role in the development of hypertension. Therefore most studies supported that there is no linear association between caffeine consumption and incident hypertension was found. Even though habitual coffee consumption was not associated with an increased risk of hypertension, consumption of sugared or diet cola was associated with it.

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