

COFFEE CONSUMPTION AND BLOOD PRESSURE VARIATION: A LITERATURE REVIEW

João Pedro Miranda Difini

Medical student. PUCRS, 2021

Porto Alegre, RS

Stephan Kunz

Medical student. ULBRA, 2021

Canoas, RS

René Ochagavia Chagas de Oliveira

Medical student. ULBRA, 2021

Canoas, RS

Gustavo Matas Kern

Medical student. ULBRA, 2021

Canoas, RS

João Vitor Dal Ponte Zatt

Medical student. ULBRA, 2021

Canoas, RS

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Abstract: Coffee is traded and consumed daily by millions of people around the world. However, despite its great popularity, little is known about its impact on blood pressure variation, given that there are numerous factors that can mask or distort the findings. Recently, many studies have been carried out in order to investigate whether there is, in fact, any association between coffee consumption and changes in blood pressure. A literature review was carried out in the PubMed database with the aim of analyzing more accurately the results obtained in the works carried out by different researchers. From the information gathered, it was observed that most studies indicate that there is no direct relationship between coffee consumption and hypertension and that many others do not show statistical significance, which corroborates the need for further studies to be carried out so that there is a more reliable correlation.

Keywords: Coffee, Blood pressure, Hypertension.

INTRODUCTION

It is known that coffee is one of the most consumed beverages in the world. The world consumption of the product in 2019 was approximately 167.90 million bags of 60 kg, with Brazil being its largest producer and second largest consumer.

However, despite the great popularity of this drink, the existence, or not, of any relationship between coffee consumption and blood pressure variations still seems to be a matter of discussion and an enigma for the medical community, since the direct correlation of two factors is susceptible to numerous variables and demands further studies with statistical significance to analyze the possible association.

While some studies point out that there is no relationship between daily coffee consumption and blood pressure variation

(BERTRAND, et al., 1978; TURNBULL, et al., 2017), others show the possibility of the drink acting as a protective factor for hypertension and other cardiovascular diseases, even in smokers (LARSSON, et al., 2008; GROSSO, et al., 2017; TORRES-COLADO, et al., 2018). There are also researchers suggesting a cause and effect relationship between coffee consumption and blood pressure variations (KLAG, et al., 2002).

Thus, this study aims to investigate, based on a literature review, the relationship between coffee consumption and possible blood pressure variations.

METHODOLOGY

A literature review was performed. The references used were consulted in the PubMed database, applying the descriptors “coffee”, “blood pressure” and “hypertension” to the search.

RESULTS AND DISCUSSION

The lack of an understanding of the direct relationship between coffee consumption and blood pressure variation and the different results found in different studies are mainly due to the fact that there are numerous factors that can alter and distort the results of the respective studies, such as factors environmental factors, the acute and chronic effects of coffee, difficulty in measuring the amount consumed by the participants and the difference in clinical repercussion when only caffeine is analyzed (GUESSOES, et al., 2014). For example, according to Noordzij et al. (2005), moderate consumption of coffee would increase blood pressure in the short term (less than 3 months). Furthermore, acute consumption of caffeine at dietary levels has been seen to tend to increase blood pressure. (JAMES, *et al.*, 2005). However, there is no clear evidence that long-term moderate consumption of coffee increases the incidence

of hypertension, given the lack of statistical significance in large-scale prospective studies and the inconsistent results of several cross-sectional studies (KLAG, et al., 2002; BERTRAND, et al., 1978). In a meta-analysis of five cohort studies, Zhang et al. (2011) found an inverted-J-curve association between coffee consumption and the risk of hypertension, in which the risk increases with consumption of up to 3 mugs per day, compared with consumption of 1 mug per day, and then decreases with higher daily doses.

Studies were also found in which a direct relationship between coffee consumption and hypertension was observed. In a cohort study with a 33-year follow-up that included 1017 college men (mean age 26 years), those who consumed 3 to 4 cups of coffee a day were found to have a higher risk of developing hypertension than those who did not consume (KLAG, et al., 2002).

On the other hand, other studies have suggested that coffee consumption may have a protective effect on the development of arterial hypertension. As seen in a cross-sectional study carried out in Spain, in which 903 elderly people aged 65 years or older were observed, according to the way they consumed coffee (Did not consume; Consume caffeinated coffee; Consume decaffeinated coffee). From the data collected, the researchers came to the following conclusions: Caffeinated coffee was possibly associated with higher education, high BMI, smoking, alcohol consumption, and higher caloric intake. However, with the lowest self-reported hypertension value when compared to those who used decaffeinated coffee or did not consume the drink. (TORRES-COLADO, et al., 2018). Similarly, another study identified a possible protective effect of coffee in men, 50 to 69 years of age and smokers, who drank 8 cups of coffee per day, compared to those who

drank only 2 cups per day (LARSSON, et al., 2008). It is also worth noting that there is an important inductive effect of smoking on the liver enzyme CYP1A2, which is responsible for metabolizing caffeine. Thus, enzyme induction can mask statistical research results and a possible influence of association, if one exists (GUESSOES, et al., 2014).

Interestingly, in another study with a sample of 6386 Dutch people, antagonistic results were observed. It was noted that women who drank 6 or more cups of coffee a day had a lower risk of developing hypertension than those who consumed 3 or fewer cups a day. No significant values were found in relation to coffee consumption and blood pressure variation in men. However, in the total population, those who did not consume coffee had a lower risk of developing hypertension when compared to those who consumed at least 3 cups of coffee a day, both men and women (UITERWAAL, et al., 2007).

An important issue to be discussed is that coffee consumption was long considered a risk factor for cardiovascular diseases, such as hypertension. However, it is now known that the beverage is composed of several bioactive substances that go beyond caffeine, such as polyphenols, furans, pyrrole and maltol, which, recently, are being considered beneficial to health (GROSSO, et al., 2017).), since the action of some of the minerals and antioxidant compounds present in the beverage, such as polyphenols, have plausible biological mechanisms of antihypertensive effect, which further corroborates the hypothesis that there may be an inversely proportional relationship between coffee consumption and increased risk of hypertension (XIE, et al., 2018).

CONCLUSION

Due to the data analyzed, it's worth pointing out, despite the difficulty of producing a work with statistically significant and free from

bias and confounders, most studies indicate that there is no direct association between coffee consumption and hypertension. More research is needed to make it possible to assess more precisely whether, in fact, coffee consumption has a unique role in blood pressure variation.

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