Does Coffee Reduce the Risk of Atrial Fibrillation?

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Since atrial fibrillation is the most common cardiac arrhythmia in the United States, investigation of dietary and environmental factors contributing to risk of development of atrial fibrillation is important. Stimulants, such as caffeinated beverages, have been implicated as potential risk factors for development of arrhythmias. Coffee, perhaps the most popular caffeinated beverage worldwide, is consumed by a major fraction of Americans daily, who drink an average of 3 cups per day.[1,2] For most, the appeal of coffee may be driven by a purported cognitive and physical benefit, thought to be attributable to caffeine, although a complex set of ingredients compose this beverage.

In this issue of the *Journal of the American Heart Association* (*JAHA*), Bodar et al present an interesting study demonstrating that a moderate degree of coffee consumption in the PHS (Physicians' Health Study) was associated with a moderate decrease in the risk of developing atrial fibrillation.[3] This study population represented a large cohort (n=18 960) and interestingly showed a dose-response effect, with 1 to 3 cups of coffee per day showing a decrease in the risk of atrial fibrillation with no impact with either lessor or greater amounts of coffee.

Pharmacological Features of Coffee and Caffeine

Physiological effects of coffee have shown a protective cardiovascular effect. Caffeine has been reported to be a nonselective inhibitor of adenosine A1 and A2A receptors,[4] reducing the ability of adenosine to shorten atrial action potentials and thereby decreasing the propensity for triggering atrial fibrillation. In addition, constituents of coffee, including caffeine and polyphenols, have antioxidant properties that may potentially help protect against adverse atrial remodeling.[5] Broadly, antioxidants in coffee have been shown to improve cardiovascular health by improving lipid profiles and blood pressure.[6,7] Collectively, these findings suggest that coffee and the constituents composing coffee may be beneficial to cardiovascular and arrhythmogenic health.

Previous Studies Exploring the Link Between Atrial Fibrillation and Caffeine

Prior studies have explored the risk of atrial fibrillation with stimulant intake, such as caffeine, reporting inconsistent results. Bodar and coauthors[3] note that the Northern California Comprehensive Health Care Study and the Danish Diet Cancer and Health Study demonstrated a similar decrease in atrial fibrillation frequency with coffee, although, compared with the current study, the amount of coffee required to see a beneficial effect was greater in both studies.[8,9] In contrast, the WHS (Women's Health Study) and a large study by Wilhelmsen et al showed a higher risk of atrial fibrillation with moderate amounts of coffee consumption (1–4 cups per day).[10,11] More important, patients in the latter studies had more cardiovascular risk factors, including tobacco use, high blood pressure, and diabetes mellitus. In the Japan Cohort Consortium, coffee consumption up to 5 cups per day reduced overall mortality in men and women, with decreases in disease-specific mortality, including heart disease, but not in cancer-related death.[12]

The current analysis looks at the PHS, which was a 2-part study initially consisting of 22 071 US male physicians randomized in a double-blind manner to aspirin and beta carotene.[3] The second part of this study consisted of 14 641 US male physicians randomized to several vitamins. Established strengths of data gathered through the PHS include large sample size and granularity of data collected, which can be used to examine other questions. The authors were able to quantify the amount of reported daily caffeine intake to construct a dose-response impact. Traditional risk factors for atrial fibrillation, such as hypertension, diabetes mellitus, and vascular disease, were well represented in this study and adjusted for in an attempt to isolate the effect of caffeine on risk of atrial fibrillation. Overall, the findings reported by Bodar et al[3] are consistent with the mentioned other large-population studies

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and the translational data. The contrast with other studies may be caused by the underlying differences with regard to sex and cardiovascular risk factors. Whether these varying results are caused by a sex difference, different coffee formulations in different studies, or dietary reporting variances is unclear. An issue with the present study and similar studies is that participants were required to recall their coffee intake, which may have not always been accurate. Furthermore, participants also report atrial fibrillation episodes that could have missed subclinical episodes. Finally, the PHS is enriched for generally healthy individuals, so it is difficult to know if these results are generalizable to our patients, who may, on average, have different health habits. Finally, these studies were not specifically designed to look at the impact of coffee on atrial fibrillation.

Conclusion

The impact of caffeine and, specifically, coffee on the risk of atrial fibrillation in the general population remains a question when speaking to our patients. Based on the current study by Bodar et al,[3] it would seem reasonable to conclude that a moderate amount coffee may lead to a neutral to slightly decreased risk of atrial fibrillation in a generally healthy population, but whether there is a beneficial impact of coffee in the general population remains to be seen. Ultimately, moderation may be a practice worth preaching. Given limitations in observational data, prospective studies seeking to evaluate the relationship between atrial fibrillation and coffee would be an important next step.

Disclosures

None.

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