

Polycystic ovary syndrome, cardiovascular risk, and coffee: a complex interplay

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The recent article by Ildarabadi et al. [1], “Effects of green coffee supplementation on paraoxonase-1 activity and malondialdehyde levels in Iranian women with polycystic ovary syndrome: a randomized clinical trial,” published in *Osong Public Health Research Perspectives* (2024), highlights the potential benefits of green coffee in addressing metabolic and oxidative stress-related aspects of polycystic ovary syndrome (PCOS). This compelling research inspires further exploration into the intricate relationships among PCOS, cardiovascular risk, and coffee consumption.

PCOS is a multifaceted endocrine disorder with significant metabolic and cardiovascular implications. Its prevalence among women of reproductive age underscores the importance of understanding and mitigating associated risks [2]. Recent studies have emphasized oxidative stress, dyslipidemia, and insulin resistance as central mechanisms driving cardiovascular complications in PCOS [3,4]. Intriguingly, coffee—a widely consumed beverage with antioxidant properties—has emerged as a potential modulator of these risks [5].

Coffee contains bioactive compounds such as chlorogenic acid, which is known for its antioxidative and anti-inflammatory effects [5]. Evidence suggests that moderate coffee consumption may increase paraoxonase-1 (PON-1) activity, reduce oxidative stress markers like malondialdehyde, and improve the lipid profile [6]. The randomized trial conducted by Ildarabadi et al. [1] demonstrated that green coffee supplementation significantly increased PON-1 levels and lowered cholesterol and triglyceride levels in women with PCOS. These findings align with broader research indicating that coffee has the potential to modulate metabolic pathways implicated in PCOS, including those influencing glucose and lipid metabolism [7].

However, the relationship between coffee and cardiovascular health in PCOS is complex. High caffeine intake can intensify sympathetic nervous system activity, potentially increasing the risk of arrhythmia in predisposed individuals [8]. Moreover, disparities in the effects of coffee may arise due to varying caffeine tolerance, genetic predispositions, and the hormonal milieu specific to PCOS [7,8].

Despite these complexities, integrating coffee or its bioactive components into dietary recommendations offers promise as a complementary strategy for cardiovascular risk reduction in PCOS [9]. Future research should aim to establish dose-response relationships, explore the long-term impacts of coffee consumption, and examine interactions with common pharmacological treatments for PCOS. Such insights will be instrumental in developing

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personalized interventions for this high-risk population [10].

Thank you for the opportunity to share these observations. I hope they contribute to ongoing discourse and encourage further exploration of this pertinent intersection.

Notes

Ethics Approval

Not applicable.

Conflicts of Interest

The author has no conflicts of interest to declare.

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Availability of Data

Not applicable.

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HIGHLIGHTS

- Bioactive compounds in coffee, such as chlorogenic acid, have antioxidative and anti-inflammatory effects, which may help reduce oxidative stress and metabolic dysfunction commonly seen in polycystic ovary syndrome (PCOS).
- Moderate coffee consumption has been associated with increased paraoxonase-1 (PON-1) activity and improved lipid profiles, which could help mitigate the heightened cardiovascular risk in women with PCOS.
- While coffee may offer benefits, excessive caffeine intake can stimulate the sympathetic nervous system, potentially worsening arrhythmia risk in predisposed individuals with PCOS, necessitating personalized dietary recommendations.