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Effects of coffee on the gut-brain axis

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Coffee is one of the most consumed and popular beverages in the world, but its effects on different individuals depending on their health history still stand debatable. It was declared as “possibly carcinogenic to humans” by the specialised cancer agency of WHO, in 1991. However, it was proved in 2016 that the scientific evidence is not enough to show any correlation between coffee consumption and cancer. Although coffee is associated with increased blood pressure, it has shown a positive impact in lowering the risks of heart attack and hypertension. Plenty of research has been done on the psychological effects of coffee in the brain, but its crucial role in the case of the gut-brain axis is yet to be investigated. The gut-brain axis (GBA) connects the gut functions with the emotional and cognitive centres of the brain. Coffee consumption, in terms of GBA, has shown an increase in salivary alpha-amylase (sAA) and salivary gastrin, with no increase in salivary cortisol levels. These salivary biomarkers have exhibited an association with gut microbiota composition and diversity. Coffee can also activate the sympathetic nervous system (SNS), despite the SNS activation and high blood pressure, coffee is an anti-stress agent and is known to reduce hypertension. Further studies may help in understanding the various components of coffee that might be responsible for these contradictory results. Taking Parkinson’s disease into consideration, there is a significant decline in the dopaminergic neurons, which can be improved with caffeine (a component of coffee). This induces neuroprotection and improves cognitive dysfunction and memory. However, in the case of schizophrenia, patients with positive symptoms must control their caffeine intake. In contrast, patients with cognitive and negative symptoms can benefit from caffeine consumption. An extensive and deeper study of coffee on GBA, in terms of healthy and special cases of disease-affected individuals, can help in paving the way for our obscure understanding of the effects of coffee on overall human health. A deeper understanding of the mechanism of action of different components of coffee can help the scientific community to develop targeted functional foods and drugs to improve GBA health.

Keywords: Gut-brain axis, Schizophrenia, Parkinson's disease, Hypertension, Caffeine

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