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Effects of Coffee on Gut Microbiota and Bowel Functions in Health and Diseases: A Literature Review

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Background and objectives: As one of the most popular beverages in the world, coffee has long been known to affect bowel functions such as motility, secretion, and absorption. Recent evidence obtained in human and animal studies suggests that coffee has modulating impacts on gut microbiota. We aim to present an overview of the specific effects of coffee on gut microbiota composition, diversity, and growth. We will also critically review the impacts of coffee on bowel functions in health and diseases and discuss whether gut microbiota play a role in the coffee-associated functional changes in the gastrointestinal tract. Methods: We searched the literature up to June 2024 through PubMed, Web of Science, and other sources using search terms such as coffee, caffeine, microbiota, gastrointestinal infection, motility, secretion, gut-brain axis, absorption, and medication interaction. Clinical research in patients and preclinical studies in rodent animals were included. Results: A majority of the studies found that moderate consumption of coffee (<4 cups a day) increased the relative abundance of beneficial bacterial phyla such as Firmicutes and Actinobacteria and decreased Bacteroidetes. Moderate coffee consumption also increased *Bifidobacterium* spp. and decreased the abundance of Enterobacteria. Coffee consumption is reported to increase gut microbiota diversity. Although the effects of coffee on bowel functions have been known for a long time, it is not until recently that we have recognized that some of the effects of coffee may be partly due to its impacts on microbiota. Conclusions: The current literature suggests that moderate coffee consumption has beneficial effects on oral and gut microbiota and motility function. However, excessive coffee intake (>5 cups a day) is implicated in reflux disorders, periodontal diseases, and progression of Crohn's disease. Further research in the field is needed, as there are many conflicting results regarding the impacts of coffee in the gastrointestinal tract.

Biography

Dr. Shi is currently a tenured Professor in the Division of Gastroenterology and Hepatology, Department of Internal Medicine at the University of Texas Medical Branch (UTMB) in Galveston, Texas. Dr. Shi earned his M.D. from Wannan Medical College in China, and received his graduate education and post-doctoral training at the Medical College of Wisconsin. He is an American Gastroenterology Association Fellow. His research has been focused mainly on neurogastroenterology and gut inflammation. As a principal investigator/project director, Dr. Shi has been awarded multiple R01 grants from National Institute of Health (NIH), and Investigator-Initiated Research Award from the US Department of Defense (DoD) among other extramural and internal grants. He has authored and co-authored more than 50 peer-reviewed journal articles and 4 book chapters, and served as a scientific reviewer for federal grant agencies such as NIH, DoD, and VA. He has also served as an academic editor in editorial board in several peer-reviewed journals

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