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Association between coffee, caffeine and gut biodiversity: A United States-Veteran Microbiome Project Sub-Study

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The gut microbiome can be influenced by lifestyle, with diet being potentially an important strategy method to modify the microbiome for positive health outcomes. Caffeine is highly consumed in the typical US diet via coffee but consumed in excessive amounts in the military/Veteran population. It is theorized that caffeine and coffee consumption may have a negative effect on gut health, with select studies linking caffeine/coffee intake to irritable bowel syndrome and gut permeability. **PURPOSE:** Explore the association of coffee and caffeine intake with gut health (defined herein as alpha-diversity) in US Veterans. **METHODS:** The Veteran Microbiome Project is a branch of the Veteran Affair's Military and Veteran Microbiome Consortium for Research and Education. Using this framework, alpha-diversity of 331 Veterans (275 men; mean age = 48±13 years, mean BMI = 29±6) was assessed from fecal samples through unique operational taxonomic units [OTUS], Shannon Diversity Index, and Pielou Evenness. Coffee and caffeine intake were measured using a semi-quantitative food frequency questionnaire. Associations between coffee, caffeine and measures of alpha-diversity were assessed using linear regression, adjusting for age, sex, and BMI. **RESULTS:** On average, Veterans consumed 1.4±1.7 numbers of coffee per day and caffeine intake was 171±178 mg. Coffee was associated with OTUS (standardized $\beta = 0.11$, $p = 0.044$), Shannon Index (standardized $\beta = 0.17$, $p = 0.002$), and Evenness (standardized $\beta = 0.16$, $p = 0.004$). Including caffeine in each model attenuated associations such that they were no longer significant ($p>0.05$ for all). **CONCLUSION:** Our findings suggest that coffee, particularly caffeine, may play a role in gut alpha diversity. Those Veterans who consumed higher amounts of coffee and caffeine had higher levels of gut diversity suggesting more favorable gut health.

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