



Coffee Consumption and Health Effects Studies in the Post Genomic Era: a brief review

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RATIONALE

Coffee is a complex mixture of bioactive compounds that play a myriad of effects in humans. Genome-wide associations studies (GWAS) of coffee consumption led to the identification of a series of genetic locus highly expressed within the coffee consumer population. In parallel, there are many epidemiologic studies pointing to beneficial health effects of daily coffee intake. Mendelian randomization (MR) is increasingly used to determine if the data obtained from GWAS and epidemiologic studies of coffee and caffeine consumption could provide support for a causal role of coffee and/or caffeine use on reducing the risk of various diseases.

METHODS

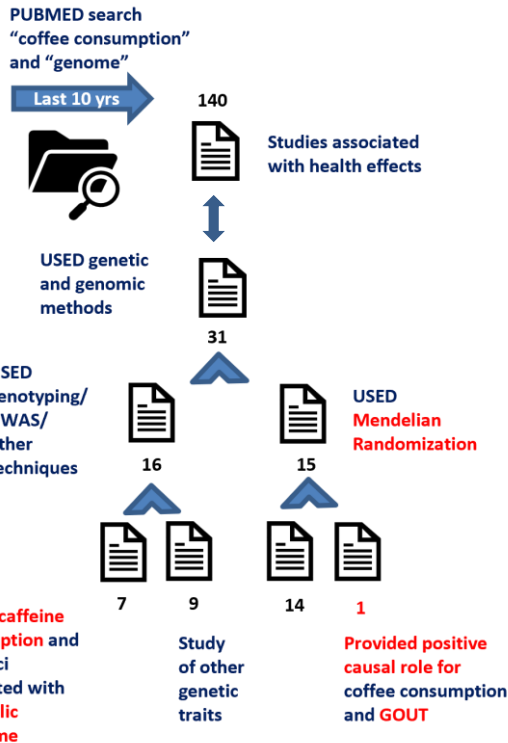
This review used the terms 'coffee consumption' and 'genome' to search within the PubMed database in the last 10 years. The search was narrowed to 140 studies that targeted effects on human health. Only 31 used in their methods genetic or genomic techniques, such as genotyping and GWAS. Sixteen out of the 31 studies used genotyping and/or other genomic methods, while all the other 15 studies used MR methodology to investigate a causal role for coffee consumption and health benefits. All the MR studies used for their randomization GWAS from the Coffee and Caffeine Consortium.

RESULTS

As new gene loci are identified through GWAS, new areas of association studies such as, sleep quality and impact of perception of bitter taste started to be investigated as well. Seven out of the sixteen genetic/genomic studies associated with coffee/caffeine consumption were searching for gene loci related with metabolic syndrome. Only one out of fifteen MR studies, which examined the association of coffee and gout was able to provide a causal role for coffee drinking and gout. Most of the MR studies felt short due to confounders such as trait heterogeneity, pleiotropy, and collider bias.

CONCLUSIONS & PERSPECTIVES

- There is a need for new GWAS within the population for search of loci associated with coffee consumption independent of the caffeine intake. Much could not be concluded from the MR studies due to factors associated with metabolism of caffeine and caffeine content in the coffee beverage.
- Chronic diseases such as metabolic syndrome, type 2 diabetes continue to be major concern in the search on new potential treatment and prevention.
- New MR studies are being designed to allow the determination of the causal role of the daily coffee intake with data collected from epidemiological studies.



References

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- Larsson SC & Carlstrom M 2018 Ann Rheum Dis 77, 1544-46