
Basic Science

Abstract citation ID: jjae190.0209**P0035****Food compounds associated with disease activity in Inflammatory Bowel Disease: a novel approach**M. Meima^{1,2}, J. Westerhout¹, M. Meijerink¹, S. Bijlsma¹, F. van Schaik², B. Oldenburg², G. Houben^{1,3}¹The Netherlands Organization for Applied Scientific Research TNO, Risk Analysis for Prevention- Innovation and Development, Utrecht, The Netherlands ²University Medical Center Utrecht, Department of Gastroenterology and Hepatology, Utrecht, The Netherlands ³University Medical Center Utrecht, Center for Translational Immunology, Utrecht, The Netherlands

Background: Diet plays a disease modifying role in inflammatory bowel disease (IBD), but specific relevant dietary factors have yet to be identified. Previous studies examining the role of diet in IBD have typically analysed food groups or specific macro- and micronutrients. To enhance our understanding, we conducted multivariate analyses on the intake of an extensive range of food compounds, using dietary data from a Dutch IBD cohort.

Methods: We used dietary and disease status data from IBD patients at the University Medical Center Utrecht, The Netherlands. Dietary data were previously collected using a Food Frequency Questionnaire at baseline. Intake levels for 768 compounds from 135 patients were calculated (Meima et al., 2024, submitted). Hereto, we applied a previously developed tool to translate dietary data into food compounds intake data (Meima et al., 2023). This tool serves as an integrated database, combining compound concentration data from three sources: the Dutch food compounds database NEVO, and international food compounds databases FooDB, and Phenol-Explorer. Using random forest analyses, we explored associations between compound intakes and IBD activity by comparing patients who experienced flares (n=41) or remained in remission during a median follow-up of 29 months (interquartile range 20-48 months). We assessed the potential biological relevance of the most significant compounds (n=35) by examining existing literature on IBD, gut health or immunomodulation.

Results: Random forest models performed particularly good in predicting remission, with specificities and negative predictive values NPVs up to 77 and 79%, respectively. The intakes of the 35 top-ranked compounds were primarily positively associated with IBD remission (n=29). Most of these were fatty acids (n=24). Other compounds positively associated with remission were 4-hydroxyproline, ethanol, vanillin, heptadecanoyl carnitine, and heme iron. For 11 of the 35 compounds, effects on IBD or the gut were available in literature, most of which aligned with our findings. Among these was butyrate, a short chain fatty acid that has been frequently reported for its beneficial role in IBD and gut health. However, several compounds showed discrepancies with literature. For 11 compounds, immunomodulatory effects were reported in literature.

Conclusion: With a novel approach, using an integrated food compounds database, we identified several food compounds that may play a modulatory role in IBD. Further research is needed to clarify associations found in our study and validate their possible biological significance.

References:

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