Study Finds Impulsivity Shapes Diet and Gut Bacteria in Healthy Adults

Researchers in Germany and the Netherlands explored the links between impulsivity in adults without diagnosed mental disorders and the diet and gut microbiome.

They found that while impulsivity was closely associated with certain dietary choices, such as alcohol consumption, it was not directly linked to the overall gut microbiome. However, certain bacterial genera showed associations with specific dietary habits and impulsivity traits. Specifically, lack of premeditation was also associated with specific bacterial genera, including *Bifidobacterium* and certain uncultured *Lachnospiraceae taxa*.

No significant associations were found between the lack of the perseverance trait and any gut bacteria.

Study

Researchers used cross-sectional data from a multicenter German study conducted between 2017 and 2019. Participants were recruited from Frankfurt am Main and Mainz.

Participants between 18 and 50 were from the general population and were screened to exclude individuals with severe mental disorders, substance dependence, neurological conditions, or recent participation in clinical trials.

Impulsivity was measured using a questionnaire that evaluated four traits: Urgency, lack of premeditation, lack of perseverance, and sensation seeking. The UPPS questionnaire (four-factor version) was used for this assessment.

Diet was assessed via a customized food frequency questionnaire, and alcohol intake was measured using a scale developed by the World Health Organization. Additional information on medication use, demographics, and body mass index (BMI) was also collected.

Fecal samples were analyzed using gene sequencing to identify the microbial community.

Statistical analysis included ordinal regression to examine relationships between impulsivity and diet and beta diversity for overall microbiota differences. Genus-level associations were analyzed with linear models adjusting for confounders. Mediation analyses tested whether diet mediated impulsivity-microbiota associations.

Results

In this study involving 913 healthy adults, several facets of impulsivity were linked to dietary habits and specific gut bacterial genera.

Higher sensation seeking and lack of premeditation were associated with increased alcohol consumption, while urgency and sensation seeking were linked to more frequent intake of sugary drinks.

Urgency was also tied to lower fiber consumption. However, no significant associations were found between impulsivity traits and meat consumption.

While diet and alcohol intake were significantly associated with overall gut microbiota composition, none of the impulsivity traits showed such associations with global microbiota diversity.

However, at the genus level, urgency was negatively associated with Butyricicoccus and Lachnospiraceae UCG-001, while sensation seeking was positively linked to Eubacterium siraeum. Lack of premeditation was associated with Bifidobacterium and two uncultured Lachnospiraceae taxa.

Diet appeared to mediate these relationships: Sugary drink intake mediated the link between urgency and certain bacteria, and alcohol intake mediated the relationship between sensation seeking and E. siraeum. Fiber intake partially mediated the relationship between urgency and Butyricicoccus, explaining 9% of the direct effect. Lachnospiraceae UCG-001 and Butyricicoccus were also associated with healthier dietary patterns, including higher intake of fiber, fruits, and vegetables, and lower consumption of sugary drinks.

Functional pathway predictions showed trends between impulsivity and gut-brain modules, such as butyrate synthesis and tryptophan degradation, but these associations did not remain significant after correction for multiple testing.

These findings suggest that impulsivity may indirectly influence gut microbiota through dietary behaviors, especially sugary drinks, fiber, and alcohol consumption.

Conclusion

The study found that impulsivity traits, particularly sensation seeking and urgency, are linked to unhealthy dietary choices, which in turn relate to specific gut bacterial genera.

Notably, lower fiber intake in individuals with high urgency was associated with reduced abundance of beneficial butyrate-producing bacteria like Butyricicoccus and Lachnospiraceae UCG-001.

Sensation seeking was linked to both higher alcohol intake and increased levels of Eubacterium siraeum. These patterns suggest that impulsivity may shape gut microbiota indirectly through diet.

Strengths include the large, well-characterized cohort and adjustment for multiple confounders. However, limitations include the cross-sectional design and use of the four-factor UPPS rather than the newer five-factor version, as well as the lack of detailed antibiotic use history and fiber type data. Causality cannot be determined, and bidirectional effects are possible: it remains plausible that diet could influence impulsivity, with the microbiota acting as a mediator. However, this was not directly tested in the study.

Overall, findings emphasize the need for early dietary interventions to mitigate impulsivity-linked changes in the gut microbiome. Understanding these pathways may help prevent mental health issues through diet-based strategies in neurotypical individuals.

Source:

https://www.news-medical.net/news/20250804/Impulsivity-shapes-diet-and-gut-bacteria-in-healthy-adults-study-finds.aspx