Type 2 Diabetes Linked to Food Additives

Food additives are everywhere these days, largely due to the surge in processed food consumption. Yet despite their widespread use, we still know relatively little about how these additives interact—and how they may affect our health in combination.

Study

This large-scale epidemiological study included 108,643 participants with an average age of 42.5 years, tracked over 7.7 years.

Researchers assessed food additive intake using detailed food diaries, cross-referenced with food composition databases and lab analyses. From this, they identified five common additive mixtures.

Results

This is the first major study to evaluate long-term exposure to food additive mixtures in a large population and link it to T2DM risk. Over the study period, 1,131 participants were newly diagnosed with T2DM.

Two of the five additive mixtures were associated with a higher risk of developing T2DM, even after adjusting for overall nutritional quality.

- Mixture 2 included emulsifiers (such as modified starches, pectin, guar gum, carrageenan, polyphosphates, and xanthan gum), the preservative potassium sorbate, and the natural colorant curcumin. This combination was commonly found in broth, dairy desserts, fats, and sauces.
- Mixture 5 was more complex, containing acidifiers (like citric and phosphoric acids), artificial sweeteners (acesulfame-K, aspartame, sucralose), coloring and emulsifying agents (such as sulfite ammonia caramel and arabic gum), and various natural flavorings and colorants. This mixture was primarily associated with artificially sweetened or sugary beverages.

Exposure to these mixtures was linked to an 8% and 13% increase in T2DM risk, respectively. Notably, this relationship wasn't explained by the nutritional profile of the foods themselves.

Mixture 2 accounted for 18% of the diabetes risk associated with fats and sauces, while Mixture 5 explained 42% of the risk from sugary beverages and 52% from artificially sweetened drinks.

The remaining three mixtures didn't show any significant association with T2DM.

Some additives may interact in ways that amplify or reduce their individual effects. For instance, animal studies have shown that combining certain food dyes or additives—like Brilliant Blue with l-glutamic acid or Quinoline Yellow with aspartame—can heighten neurotoxicity compared to the additives used alone.

While the exact mechanisms behind the increased diabetes risk remain unclear, gut microbiome disruption is a leading hypothesis. Additives like carrageenan, acesulfame-K, and sucralose are known to affect glucose metabolism by altering gut bacteria.

Interestingly, individuals with T2DM often have microbiome profiles similar to those of people who consume non-nutritive sweeteners.

Other studies suggest some mixtures may even cause cellular or genetic damage, even when each additive remains within its legal limit.

Conclusion

This study offers new insights into how combinations of food additives—rather than individual substances—may influence the risk of type 2 diabetes. Two commonly consumed additive mixtures were linked to higher T2DM risk, particularly when found in fats, sauces, and sweetened beverages.

These findings highlight the need to consider not just individual additives but how they interact in real-world food products. They also underscore the importance of updating food safety assessments to reflect the way additives are actually consumed—in mixtures, not isolation.

More research is needed to confirm these results and uncover the biological mechanisms at play. Still, the study supports public health recommendations to limit exposure to nonessential food additives.

Source:

https://www.news-medical.net/news/20250410/Are-food-additives-linked-to-type-2-diabetes.aspx