Ultra-processed foods and the risk of diabetes: a review

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The global rise in ultra-processed foods (UPF) consumption is increasingly linked to the rising incidence of type 2 diabetes (T2D). UPF, characterized by high levels of added sugars, unhealthy fats, sodium and various artificial additives, provide little nutritional value and are associated with adverse metabolic effects. These foods contribute significantly to insulin resistance, chronic hyperglycemia, weight gain and low-grade inflammation, all of which are key risk factors for the onset of T2D. Findings from epidemiological studies, such as the NutriNet-Santé cohort, indicate a strong correlation between UPF intake and the increased risk of developing T2D. Meta-analyses reveal that for every 10% increase in UPF consumption, there is a 12–25% increase in the risk of T2D. Cross-sectional studies further confirm that UPF-heavy diets contribute to poor glycemic control and elevated fasting blood glucose levels. Public health interventions targetting the reduction of UPF consumption are crucial to mitigating this global diabetes epidemic. The NOVA food classification system offers a practical framework for identifying and categorizing UPFs and facilitating dietary reforms. Future research should explore the specific roles of food additives and industrial processing techniques in order to reduce the risk of T2D.

Keywords: Diet quality, dietary patterns, obesity and processed foods, type 2 diabetes, ultra-processed foods.

Global consumption of UPF has risen dramatically, particularly in high-income countries like the United States and Australia, where these products now account for over 50% of total caloric intake[7,8]. In Russia, the consumption of processed food has significantly increased[9]. This dietary shift, once concentrated in wealthier nations, has increasingly spread to low- and middle-income countries, including India, where the consumption of UPF is also rising at an alarming rate[10]. An average Indian household derives more calories from processed foods than fruits, as shown by earlier studies[11,12]. The result is a changing pattern of disease and illness related to diet[13]. The World Obesity Atlas 2024 reports that the projected numbers of children with high BMI and child obesity in India is predicted to increase at a compound annual growth rate of 6.2% between 2020 and 2035 (ref. 14). The rise in UPF consumption has been strongly linked to the growing prevalence of non-communicable diseases (NCDs) like cardiovascular disease, hypertension and type 2 diabetes (T2D). In India, where diabetes is reaching epidemic levels, this shift is particularly concerning. Early studies showed a diabetes prevalence of just 2.1% in urban areas and 1.5% in rural areas, but in the last two decades, rapid urbanization, increased disposable income, and the influence of Westernized food cultures have contributed to a surge in the consumption of UPFs across both urban and rural areas[15,16]. The Indian Council of Medical Research-