THE RELATIONSHIP BETWEEN EXCESSIVE SUGAR AND FAT INTAKE AND GESTATIONAL DIABETES MELLITUS

Umedova M. E.
Gulmirzayeva M. M.
Tashkent State Medical University

Gestational diabetes mellitus (GDM) is a condition characterized by hyperglycemia first diagnosed during pregnancy, which increases the risk of both short- and long-term complications for the mother and child. In recent years, the prevalence of GDM and pregnancy-related hyperglycemia has been increasing worldwide. According to the International Diabetes Federation (IDF) 2024 report, approximately one in six live births (≈15–16%) is affected by some form of hyperglycemia during pregnancy, with the majority of these cases attributable to GDM.

Global epidemiological assessments indicate that the prevalence of GDM varies by economic development level: 12–15% in low-income countries, approximately 9% in middle-income countries, and about 14% in high-income nations. These estimates are based on the standardized diagnostic criteria developed by the International Association of Diabetes and Pregnancy Study Groups (IADPSG).

At the regional level, the burden of GDM remains significant. In Uzbekistan, epidemiological surveys and health reports indicate a GDM prevalence ranging between 9% and 12%. For instance, a national pilot study conducted across six regions reported a prevalence rate of 9.47%. GDM is associated not only with perinatal complications (such as macrosomia, cesarean delivery, and neonatal hypoglycemia) but also with long-term metabolic consequences — for the mother (an increased risk of type 2 diabetes and cardiovascular diseases) and for the child (a higher likelihood of obesity and type 2 diabetes later in life).

The pathophysiology of GDM is primarily based on the physiological insulin-resistant state of pregnancy. Placental hormones — including human placental lactogen (hPL), progesterone, estrogen, and other mediators — reduce insulin sensitivity during the later stages of pregnancy. In most women, this condition is compensated by enhanced β-cell insulin secretion; however, when this compensatory mechanism is insufficient, gestational diabetes develops.

Currently, leading organizations such as IADPSG, WHO, and ADA recommend assessing GDM between 24–28 weeks of gestation using the oral glucose tolerance test (OGTT). This approach underlines the clinical importance of GDM and the necessity of early detection and management.

Dietary habits have a substantial impact on the risk of gestational diabetes. In particular, added sugar intake and the consumption of sugar-sweetened beverages (SSB) have been consistently identified as risk factors. For example, according to data from the Nurses' Health Study II,

women who consumed five or more servings of sugar-sweetened cola per week prior to pregnancy had a 22% higher risk of developing GDM (RR = 1.22; 95% CI: 1.01–1.47).

Broader epidemiological evidence also shows that sugar-sweetened beverages and diets with a high glycemic load increase the risk of metabolic diseases, including type 2 diabetes, which aligns mechanistically with the pathogenesis of GDM. Recent reviews emphasize that "unhealthy diets" — characterized by refined grains, added sugars, and processed high-fat foods — increase the risk of GDM, whereas the Mediterranean diet or diets rich in vegetables, fruits, whole grains, and healthy fats can reduce the risk.

Regarding fat intake, the evidence remains somewhat complex. Several studies suggest that high consumption of saturated fats and fat-rich diets increases the risk of GDM, while replacing saturated fats with unsaturated (plant-based) fats may reduce this risk. Other recent investigations, however, have not found a strong association between total carbohydrate or total fat intake and GDM, though a link between protein proportion and GDM risk has been observed. This highlights the importance of evaluating the quality and source of macronutrients rather than quantity alone.

In conclusion, current scientific evidence supports limiting added sugars and sugar-sweetened beverages, reducing the consumption of refined and saturated fat-rich foods, and promoting balanced, nutrient-dense dietary patterns — particularly those based on fruits, vegetables, whole grains, nuts, fish, and olive oil — as effective strategies for preventing gestational diabetes mellitus.

References.

1. Park S, Kim MY, Baik SH, Woo JT, Kwon YJ, Daily JW, Park YM, Yang JH, Kim SH. Gestational diabetes is associated with high energy and saturated fat intakes and with low plasma visfatin and adiponectin levels independent of prepregnancy BMI. Eur J Clin Nutr. 2013 Feb;67(2):196-201. doi: 10.1038/ejcn.2012.207. PMID: 23385969.
2. Akhmadaliyeva, N. O., Salomova, F. I., Sadullayeva, K. A., Abdukadirova, L. K., & Imamova, A. O. (2024). RETRACTED: Nutrition of frequently ill preschool children in organized collectives. In BIO Web of Conferences (Vol. 84, p. 01011). EDP Sciences.
3. Абдукадирова, Л. К., & Умирбеков, О. Д. (2020). Даволаш профилактика муассасалари радиология бўлими хоналаридаги нурланиш доза даражасини аниқлаб баҳолаш. Интернаука, (2-2), 68-69.
4. Salomova, F. I., Mavlonov, A., & Abdukadirova, L. K. (2024). Talabalar o'rtasida gastritning tarqalishi va to'g'ri ovqatlanishning ahamiyati.
5. Sherkuzieva, G. F., Salomova, F. I., & Yuldasheva, F. U. (2023). Oziq ovqat qo'shimchalari va aholi salomatligi. 2023.«. O 'zbekistonda vinochilik va sanoat

Uzumchiligi sohasining muammolari va Ularning innovatsion yechimlari» Respublika ilmiy-texnikaviy konferensiya Ilmiy ishlar to ‘plami, 101-102.

6. Sadullayeva, X. A., Salomova, F. I., Mirsagatova, M. R., & Kobiljonova Sh, R. (2023). Problems of Pollution of Reservoirs in the Conditions of Uzbekistan.
7. Salomova, F. I., Ahmadalieva, N. O., Sadullaeva, K. A., & Sherkuzieva, G. F. (2022). Dust storm and atmosphere air pollution in Uzbekistan.
8. Rahimov, B. B., Salomova, F. I., Jalolov, N. N., Sultonov, E. Y., Qobiljonova Sh, R., & Obloqulov, A. G. (2023). O ‘ZBEKISTON RESPUBLIKASI NAVOIY SHAHRI HAVO SIFATINI BAHOLASH: MUAMMOLAR VA YECHIM YOLLARI.
9. Salomova, F. I., Imamova, A. O., Mirshina, O. P., & Voronina, N. V. (2023). HYGIENIC ASSESSMENT OF THE CONDITIONS OF WATER USE OF THE POPULATION OF THE ARAL REGION. Academic research in educational sciences, 4(TMA Conference), 968-973.
10. Sadullaeva, K. A., Sadirova, M. Q., Ikramova, N. A., & Sotivoldieva, S. A. (2025). EFFECT OF NUTRITION ON HEALTH OF SCHOOL STUDENTS.
11. Sherko'zieva, G. F., Ikramova, N. A., Bakhriddinova, M. N., Toshpulatov, B. M., Boysarieva, M. R., & Abdurashidova, D. J. & Rasulov, RS (2025). ATMOSPHERIC AIR AND HEALTH.
12. Qosimova, X. T., Ikramova, N. A., Juraboyeva, D. N., & Mukhtorova, D. A. (2025, March). THE ADVERSE EFFECTS OF SMARTPHONES ON COGNITIVE ACTIVITY IN THE EDUCATIONAL PROCESS AND WAYS TO MITIGATE THEM. In The Conference Hub (pp. 76-79).
13. Kosimova, K. T., Jalolov, N. N., & Ikramova, N. A. (2025, April). THE RELATIONSHIP BETWEEN AIR POLLUTION AND ARTERIAL HYPERTENSION. International Conference on Advance Research in Humanities, Applied Sciences and Education.
14. Jalolov, N. N., Umedova, M. E., & Ikramova, N. A. (2025, April). Occupational risk factors for workers operating in hot climates: the case of traffic police officers. International Conference on Advance Research in Humanities, Applied Sciences and Education.
15. Sharipova, S. A., Ikramova, N. A., Bahriddinova, M. N., Toshpulatov, B. M., & Egamberdiyeva, Z. Z. (2025, March). SPECIFIC ASPECTS OF PREVENTION OF INFECTIOUS DISEASES. International Conference on Advance Research in Humanities, Applied Sciences and Education.
16. Ikramova, N. A., & Axmedova, R. D. (2025, April). THE IMPACT OF ATMOSPHERIC AIR POLLUTION ON HUMAN HEALTH. In The Conference Hub (pp. 7-10).
17. Ikramova, N. A., & Axmedova, R. D. (2025, March). THE IMPACT OF ATMOSPHERIC ENVIRONMENTAL POLLUTION ON HUMAN HEALTH: THE ROLE OF MOTOR

VEHICLES AND INDUSTRIAL EMISSIONS. International Conference on Advance Research in Humanities, Applied Sciences and Education.

18. Умедова, М. Э., Акбарова, М. А., Таджидинова, А. Ж., & Сунатуллаева, С. Т. (2025, April). Оценка угрозы излишнего поступления в организм поваренной соли за счет употреблении хлебобулочных изделий. International Conference on Advance Research in Humanities, Applied Sciences and Education.
19. Акбарова, М. А., Таджидинова, А. Ж., Умедова, М. Э., & Сунатуллаева, С. Т. (2025, April). ОЦЕНКА УГРОЗЫ ИЗЛИШНЕГО ПОСТУПЛЕНИЯ В ОРГАНИЗМ ПОВАРЕННОЙ СОЛИ ЗА СЧЕТ УПОТРЕБЛЕНИИ ХЛЕБОБУЛОЧНЫХ ИЗДЕЛИЙ. In The Conference Hub (pp. 119-121).