



Toshkent tibbiyot akademiyasi Urganch filiali “Jamoat salomatligi va umumiy gigiyena” kafedrasi mudiri, Ibadulla Qochkarovich Abdullayevning 70 yilligiga bag‘ishlangan “Sog‘liqni saqlash tizimida menejmentning zamonaviy muammolari va istiqbollari” mavzusidagi xalqaro ilmiy-amaliy anjuman 2025-yil 20-21 oktabr

## METABOLIC FEATURES OF DYSLIPIDEMIA IN PATIENTS WITH TYPE 2 DIABETES MELLITUS AND NON-ALCOHOLIC FATTY LIVER DISEASE IN THE KHOREZM REGION

Rahmetova M.R., Bakhtiyarova A.M., Abdullayev R.B.

*Urgench branch of Tashkent medical academy, Urgench*

**Relevance.** The growing prevalence of type 2 diabetes mellitus (T2DM) worldwide is closely associated with an increase in non-alcoholic fatty liver disease (NAFLD). In the Khorezm region, local risk factors such as sedentary lifestyle, dietary habits, and environmental influences contribute to a high burden of metabolic disorders. NAFLD exacerbates insulin resistance and complicates the clinical course of T2DM, increasing the risk of liver and cardiovascular complications. Despite standard therapy, effective correction of lipid metabolism and liver dysfunction remains a challenge. Thus, investigating adjunct therapies such as *Nigella sativa* seeds and hepatoprotective agents like Protecto Hepar is of considerable clinical importance.

**Research objective.** To identify the features of lipid metabolism disorders in patients with type 2 diabetes mellitus (T2DM) complicated by fatty hepatitis (FH) living in the Khorezm region, considering local risk factors, and to substantiate the effectiveness of including the nutraceutical component — *Nigella sativa* seeds — in comprehensive therapy for correction of metabolic disturbances and improvement of liver function.

**Materials and methods.** The study involved 120 patients with T2DM and NAFLD treated at the Khorezm branch of the Scientific-Research Medical Center of Endocrinology (mean age  $53.2 \pm 6.7$  years; 64.2% females). Patients were divided into two comparable groups: the research group (60 patients) received standard pharmacotherapy for T2DM and NAFLD including *Nigella sativa* seeds (2 g/day for 12 weeks), and the control group (60 patients) received standard therapy alone. Clinical examination included anthropometric measures, blood pressure, and liver ultrasound to assess steatosis (grades I–III). Laboratory tests evaluated lipid profile (TC, LDL-C, HDL-C, TG), carbohydrate metabolism (fasting glucose, HbA1c), insulin resistance (insulin, HOMA-IR), and liver enzymes (ALT, AST). Lifestyle, dietary habits, and risk factors (physical inactivity, smoking, family history, environmental exposures) were also assessed.

**Results and discussion.** At baseline, both groups showed metabolic syndrome signs with dyslipidemia (TG  $2.4 \pm 0.8$  mmol/L), increased TC and LDL-C, reduced HDL-C ( $0.91 \pm 0.2$  mmol/L), poor glycemic control (HbA1c  $> 8.1\%$  in 71%), elevated ALT, and HOMA-IR  $> 3.5$  confirming insulin resistance. After 12 weeks, the research group exhibited significant improvements: TG decreased by 27.8% ( $p < 0.01$ ), LDL-C by 18.3% ( $p < 0.05$ ), HDL-C increased by 11.6% ( $p < 0.05$ ). ALT and AST decreased by 29% and 24%, respectively ( $p < 0.01$ ), indicating reduced liver injury. HOMA-IR improved from 4.2 to 2.9 ( $p < 0.01$ ). Ultrasound showed steatosis regression in 41% (23% from grade II to I, 18% complete resolution). The control group showed minor, statistically insignificant changes. *Nigella sativa* was well tolerated without adverse effects. Its antioxidant, hypolipidemic, and hepatoprotective properties likely explain the benefits observed.

**Conclusions.** Patients with T2DM complicated by fatty hepatitis in the Khorezm region demonstrate pronounced lipid metabolism disorders, insulin resistance, and elevated liver enzymes, requiring a multifaceted therapeutic approach. Supplementation with *Nigella sativa* seeds in therapy results in significant metabolic improvement, steatosis reduction, and enzyme normalization, supporting their use in NAFLD treatment. Given their safety, accessibility, and efficacy, these agents can be recommended as part of comprehensive treatment, particularly in high-risk regions like Khorezm. The results have practical implications for regional guidelines and national prevention programs addressing endocrine and hepatobiliary diseases in Uzbekistan.