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**CHARACTERISTICS OF LIPID SPECTRUM IN MEN WITH HYPOGONADISM AND
TYPE 2 DIABETES MELLITUS**

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Introduction. Type 2 diabetes mellitus (T2DM) is one of the most important medical and social problems worldwide due to its high prevalence and its association with severe metabolic and cardiovascular complications. In men, T2DM is often accompanied not only by hyperglycemia and insulin resistance, but also by abdominal obesity, dyslipidemia, and hormonal imbalance. In recent years, special attention has been paid to functional hypogonadism in men with T2DM, since decreased testosterone levels may worsen metabolic disturbances and contribute to the progression of cardiometabolic risk. Testosterone deficiency is considered not only a reproductive disorder, but also an important component of systemic metabolic dysfunction associated with increased visceral adiposity, impaired insulin sensitivity, and unfavorable lipid metabolism. Therefore, studying the relationship between androgen status and lipid profile parameters in men with T2DM is of considerable scientific and practical relevance.

Objective. To study the characteristics of the lipid profile and to assess its relationship with total testosterone levels in men with type 2 diabetes mellitus.

Materials and methods. The study had an observational, cross-sectional, comparative design. It included 60 men aged 30 to 55 years with a confirmed diagnosis of type 2 diabetes mellitus. The mean age of the examined patients was 45.1 ± 6.5 years, the mean duration of diabetes was 7.4 ± 2.2 years, and the mean glycated hemoglobin (HbA1c) level was $10.97 \pm 2.57\%$, indicating insufficient glycemic control in the study population.

Depending on the level of total testosterone, all participants were divided into two groups. The first group included men with preserved gonadal function (eugonadal group; total testosterone ≥ 12 nmol/L; $n = 32$), while the second group included patients with laboratory-confirmed hypogonadism (total testosterone < 12 nmol/L; $n = 28$).

All patients underwent clinical and laboratory examination. The lipid profile included assessment of total cholesterol, triglycerides, low-density lipoproteins (LDL), and high-density lipoproteins (HDL). The obtained results were compared between the two groups in order to identify possible associations between androgen deficiency and lipid metabolism disturbances.

Results. Patients with total testosterone levels below 12 nmol/L demonstrated more pronounced lipid metabolism abnormalities than eugonadal patients. In the hypogonadal group, total cholesterol was significantly higher than in the eugonadal group (5.77 ± 1.28 vs 4.95 ± 0.92 mmol/L), as were triglycerides (2.99 ± 1.42 vs 2.28 ± 1.04 mmol/L) and LDL cholesterol (3.25 ± 0.87 vs 2.84 ± 0.90 mmol/L) (all $p < 0.05$). At the same time, HDL cholesterol was significantly lower in men with hypogonadism (0.95 ± 0.34 vs 1.12 ± 0.39 mmol/L; $p < 0.05$).

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These findings indicate the formation of a more atherogenic lipid profile in patients with androgen deficiency. Such changes may reflect the adverse effect of testosterone deficiency on fat metabolism and carbohydrate-lipid interactions. Reduced testosterone levels may contribute to worsening insulin resistance, increased hepatic triglyceride synthesis, enhanced accumulation of atherogenic lipoprotein fractions, and reduced antiatherogenic protection associated with low HDL levels. Thus, hypogonadism in men with T2DM appears to be linked with more pronounced dyslipidemia and potentially higher cardiovascular risk.

Conclusion. Androgen deficiency in men with type 2 diabetes mellitus is associated with more pronounced atherogenic changes in the lipid profile, including increased total cholesterol, triglycerides, and LDL cholesterol, along with decreased HDL cholesterol. These findings suggest that hypogonadism may be considered an additional cardiometabolic risk factor in men with T2DM. Assessment of hormonal status in this category of patients is advisable for the early detection of unfavorable metabolic disturbances and for improving preventive and therapeutic strategies.

Keywords: type 2 diabetes mellitus, testosterone, hypogonadism, androgen deficiency, dyslipidemia, lipid profile, cardiovascular risk.