

THE ROLE OF TNF-Α IN THE DEVELOPMENT OF DIABETIC NEPHROPATHY IN THE SOUTHERN ARAL SEA REGION

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Introduction

Diabetic nephropathy (DN) remains one of the most serious microvascular complications of type 2 diabetes mellitus (T2DM), leading to chronic kidney disease (CKD) and eventually end-stage renal failure. Among the numerous pathogenic mechanisms involved, chronic low-grade inflammation plays a pivotal role, with tumor necrosis factor-alpha (TNF- α) recognized as a key pro-inflammatory cytokine contributing to the progression of renal injury. The Southern Aral Sea region, affected by long-term ecological degradation, presents unique environmental challenges that may influence the pathophysiology of diabetes-related complications.

Aim

The present work aimed to determine the role of TNF- α in the early diagnosis of chronic kidney disease in patients with type 2 diabetes living in the South Aral Sea region.

A cohort of patients were studied with confirmed T2DM examined at the Department of Nephrological Disease, Khorezm Regional Multidisciplinary Medical Center, Khorezm region.

Results

120 adult patients were examined: 80 patients with type 2 diabetes complicated by CKD (main group) who had suffered CKD, and 30 patients with type 2 diabetes without complication who had not suffered CKD (control group). Patients in the main (T2DM with CKD) and control groups (T2DM) did not differ, as expected, in gender (7 men (33.3%) in each group; $p=1.00$), age (64.3 ± 8.50 and 62.3 ± 5.96 years; $p=0.333$), HbA1c level (9.8 ± 2.09 and $9.6 \pm 1.82\%$; $p=0.670$), as well as body mass index (30.7 ± 5.15 and 29.2 ± 5.83 kg/m²; $p=0.131$). Both groups had the same number of patients with diabetes experience of more than 5 years (16 people each, or 76.2%; $p=1.00$). The study and control groups did not differ in the frequency of detection of such diabetes complications as nephropathy (10 (47.6%) and 11 (52.4%); $p = 0.762$), retinopathy (7 (33.3%) and 11 (52.4%); $p=0.213$) and polyneuropathy (16 (76.2%) and 11 (52.4%); $p=0.110$). Analysis of tissue growth factor (TNF- α) indicators in patients with covid 19 and diabetic nephropathy showed that TNF- α in this group was 1.9 times higher than normal (54.7 ± 6.1 ng/ml), compared with the control group it was 0.65 times higher ($p < 0.05$). Scientific studies have determined the levels of sensitivity and specificity of TNF- α as diagnostic markers in the early detection of CKD.

Conclusions

The results of our study are those of the literature regarding early diagnosis and prevention is the use of clinical practice of highly diagnostic laboratory research methods to identify CKD of various etiologies among the population.