THE BASELINE RISK FACTORS OF COVID-19 ADVERSE OUTCOMES IN PATIENTS WITH ADVANCED STAGES OF DIABETIC KIDNEY DISEASE: THE SINGLE CENTER EXPERIENCE

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BACKGROUND AND AIMS: The patients with diabetic kidney disease (DKD) due to type 2 diabetes mellitus (T2DM) are at a high risk of adverse outcomes of COVID-19. The causes of high mortality in this cohort are the subject of debate. Identification of the risk factors (RF) of adverse COVID-19 outcomes in patients with T2DM and advanced stages of DKD at hospital admission.

METHOD: The patients with laboratory-confirmed COVID-19 were included in the retrospective observational study during the hospitalization in MCCH №52, the observation period being 04 January 2020 to 31 October 2020. The study endpoints were the outcomes of hospitalization—discharge or lethal outcome. Data were collected from electronic medical database. The following independent variables were analyzed at hospital admission: gender, age, duration of T2DM, general comorbidity (Charlson Index, CCI), the insulin demand (InsD), fasting blood glucose (FBG), body mass index (BMI), NEWS scale points, white blood cell (WBC), lymphocytes and platelet count, CPR, serum albumin (SA), ferritin, LDH, and GFR.

RESULTS: A total of 120 patients were included. Median age was 69 years (IQR 63.5–79.5), females 53%. The observation group was divided into subgroups: (i) patients with advanced DKD according to GFR values not requiring maintenance hemodialysis (MHD) and (ii) patients on MHD. All patients were distinguished by high general comorbidity and duration of T2DM more than 10 years. The mortality in both subgroups was high (38.2% versus 38.5%, respectively). The results are presented in Table 1.

CONCLUSION: The patients with T2DM and advanced DKD are very vulnerable to adverse outcomes of COVID-19. High FBG, lymphopenia and high ferritin value on admission seem to be the most significant RF of lethal outcome regardless of MHD.
ASSOCIATION BETWEEN INFLAMMATORY MARKERS AND PROGRESSION OF DIABETIC KIDNEY DISEASE

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BACKGROUND AND AIMS: Diabetes mellitus is the major cause of end-stage renal disease. Patients with diabetic kidney disease (DKD) have a higher risk of mortality, mostly from cardiovascular complications. Previous studies have shown that inflammatory cytokines are involved in the pathogenesis of microvascular diabetic complications, including DKD. Standard biomarkers including serum creatinine, estimated glomerular filtration rate (eGFR) and albuminuria are relatively insensitive to small changes in renal function. Thus, availability of novel biomarkers is necessary to detect kidney injury and predict clinically significant outcomes in diabetic patients. The aim of our study was to find relation between serum inflammatory and growth markers and CKD in patients with DT2.

METHOD: A total of 155 patients with DT2, aged 34–84 years [60 (60; 72)], were examined. All patients underwent standard clinical and laboratory examination, with an assessment of the levels of interleukin (IL)-6, tumor necrosis factor (TNF)-α, high-sensitivity C-reactive protein (hs-CRP), vascular endothelial growth factor A (VEGF-A) and fibroblast growth factor-23 (FGF-23) in baseline plasma samples. Renal function was assessed based on the levels of serum creatinine, cystatin C, eGFR, which was calculated according to the CKD-EPI formula, and albuminuria, which was assessed as albumin/creatinine ratio (ACR).

RESULTS: The levels of VEGF-A, FGF-23, TNF-α, hs-CRP and IL-6 were significantly higher in diabetic patients with CKD 5 in comparison with stages 1–4. There were positive significant association between VEGF-A, FGF-23, TNF-α, hs-CRP, IL-6 and markers of renal function (creatinine, ACR). Thus VEGF-A, TNF-α and hs-CRP showed a weak and moderate correlation with creatinine, while IL-6 and FGF-23 showed a strong correlation (r = 0.70, P < 0.001, r = 0.71, P < 0.001, respectively). In addition, IL-6 significantly correlated with cystatin C (r = 0.71, P < 0.001). A strong negative correlation was also observed between IL-6 and eGFR (r = -0.73, P < 0.001).

In both unadjusted and adjusted analyses, probability of decreased eGFR was associated strongly with FGF-23 (COR (95% CI 1.890); 1.362–2.622, P = 0.001), IL-6 (1.527; 1.251–1.863, P < 0.001), hs-CRP (1.405; 1.231–1.602, P < 0.001).

When evaluating the dependence of the probability of decreased eGFR on the FGF-23 using the ROC analysis, the cut-off value of FGF-23 which corresponds to the highest Youden’s J statistic was 0.9 pmol/L. The sensitivity and specificity of the method were 75.3% and 74.5%, respectively [AUC 0.832 ± 0.035 (95% CI 0.764–0.901), P < 0.001]. The cut-off value of IL-6 was 3.1 mg/mL. The sensitivity and specificity of the method were 64.3% and 73.7%, respectively [AUC 0.750 ± 0.029 (95% CI 0.694–0.807), P < 0.001].

CONCLUSION: Involvement of mediators of inflammation and fibrogenesis in the processes of tubulointerstitial damage in patients with diabetes and CKD, confirmed by their negative correlation with GFR and positive with creatinine and albuminuria, indicates a high risk of a decrease in GFR in patients with diabetes with an increase in IL-6 ≥ 3.1 mg/mL, FGF-23 ≥ 0.9 pmol/L and hs-CRP ≥ 5.8 mg/mL along with traditional risk factors.

DIABETIC RETINOPATHY AND/OR DIABETIC NEPHROPATHY CONFERS A WORSE RENAL PROGNOSIS

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