

М.Г. Рагурам, А.Н. Аль-Джабури
ФУНКЦИЯ ПОЧЕК И БИОХИМИЧЕСКИЙ ПРОФИЛЬ
У ПАЦИЕНТОВ С ПОСТКОВИДНЫМ СИНДРОМОМ

Научный руководитель: ст. преп. Ю.В. Репина

Кафедра пропедевтики внутренних болезней

Белорусский государственный медицинский университет, г. Минск

M.G. Raguram, A.N. Al Juboori
KIDNEY FUNCTION AND BIOCHEMICAL PROFILE IN PATIENTS
WITH POST-COVID SYNDROME

Tutor: senior lecturer Y.V. Repina

Department of Propaedeutics of Internal Diseases

Belarusian State Medical University, Minsk

Резюме. В исследовании оценивали функцию почек и биохимические показатели у 172 амбулаторных пациентов 18–44 лет с постковидным синдромом после легкого течения COVID-19. Средняя СКФ составила $121,15 \pm 12,95$ мл/мин/1,73 м², сниженной СКФ не выявлено; отмечены связи СКФ с глюкозой, ЛПНП, мочевиной и ЛПВП.

Ключевые слова: постковидный синдром, функция почек, СКФ, креатинин, биохимический профиль.

Resume. This cross-sectional study examined kidney function and biochemical parameters in 172 ambulatory patients aged 18–44 years with post-COVID syndrome after mild COVID-19. Mean eGFR was 121.15 ± 12.95 mL/min/1.73 m², with no reduced eGFR; associations were found between eGFR and glucose, LDL, urea, and HDL.

Keywords: post-COVID syndrome, kidney function, eGFR, serum creatinine, biochemical profile.

Relevance. After the COVID-19 pandemic, post-COVID syndrome has emerged as a significant clinical concern. Although the acute phase of infection is often mild in young adults, increasing evidence suggests potential long-term effects on various organ systems, including the kidneys. Mild renal impairment may go unnoticed in young adults without comorbidities. Therefore, evaluating kidney function using serum creatinine and estimated glomerular filtration rate (eGFR), alongside biochemical parameters, is essential for early detection of renal dysfunction. At the same time, evidence on renal long COVID in young, initially healthy individuals after mild infection remains limited, which justifies further research in this group.

Aim: to assess kidney function in patients with post-COVID syndrome based on serum creatinine levels and eGFR, as well as to describe the characteristics of the blood biochemical profile in ambulatory patients aged 18–44 years with post-COVID syndrome after a mild course of coronavirus infection without concomitant pathology.

Objectives:

1. To evaluate serum creatinine and eGFR values in patients aged 18–44 years with post-COVID syndrome.
2. To analyze the biochemical profile, including urea, electrolytes, glucose, LDL and HDL.
3. To assess correlations between eGFR and biochemical/clinical parameters.

Materials and methods. A cross-sectional observational study was conducted among 172 ambulatory patients aged 18–44 years with post-COVID syndrome after a mild course of COVID-19. Acute COVID-19 was experienced in 2020–2023; clinical and laboratory examination was performed in 2024–2025. Inclusion criteria were a history of COVID-19, age 18–44 years, and absence of chronic diseases. Exclusion criteria were pregnancy and alcohol or drug use. Kidney function was assessed using serum creatinine levels and eGFR calculated using the CKD-EPI equation. An extended biochemical blood panel was analyzed, including urea, electrolytes (sodium, potassium), glucose, and lipid profile (LDL, HDL). Patients were planned to be divided into subgroups based on eGFR values (normal ≥ 60 mL/min/1.73 m² and reduced < 60 mL/min/1.73 m²). Statistical analysis was performed using Python. Descriptive statistics were calculated. Correlation analysis was applied to assess associations between renal function parameters and clinical variables. Statistical significance was set at $p < 0.05$.

Results and their discussion. A total of 172 patients were included in the analysis. The mean eGFR was 121.15 ± 12.95 mL/min/1.73 m², indicating that overall renal function was within normal limits. No patients were found to have reduced eGFR (< 60 mL/min/1.73 m²), suggesting preserved kidney function across the cohort. The biochemical profile demonstrated mean values within physiological ranges. Correlation analysis revealed weak to moderate associations between eGFR and metabolic parameters. A negative correlation was observed between eGFR and glucose ($r = -0.36$), LDL ($r = -0.35$), and urea ($r = -0.32$). A weak positive correlation was found between eGFR and HDL ($r = 0.20$). Electrolytes, including potassium and sodium, showed minimal or negligible correlation with eGFR. Due to the absence of patients with reduced eGFR, subgroup comparison by renal function category was not feasible.

Post-COVID Syndrome Incidence by Gender

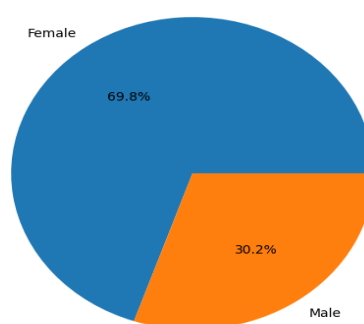


Fig. 1 – Post-covid incidence by gender

Shows the sex distribution among 172 ambulatory patients aged 18–44 years with post-COVID syndrome after mild COVID-19. The chart indicates which gender was more frequently affected, providing insight into potential sex-based susceptibility to long-term post-infection symptoms. This helps identify whether female or male young adults are more likely to seek medical attention for persistent complaints following a mild course of coronavirus infection.

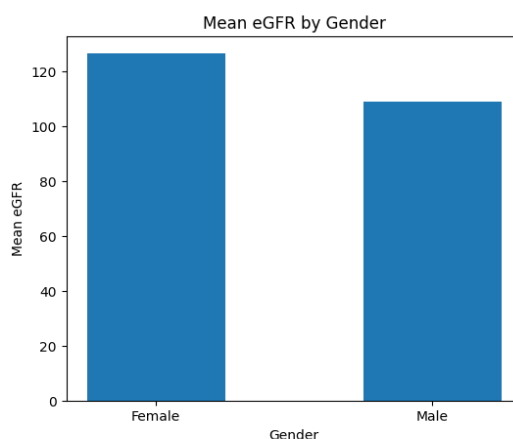


Fig. 2 – Mean egfr by gender

Compares estimated glomerular filtration rate between male and female patients. Both groups demonstrated mean eGFR values within the normal to high-normal range, with no evidence of reduced kidney function. Any slight difference between sexes may reflect physiological variation rather than pathology, supporting the conclusion that mild COVID-19 does not cause clinically significant renal impairment in young adults of either gender.

Conclusions:

1. The absence of reduced eGFR values suggests that mild COVID-19 does not lead to marked kidney dysfunction in young adults.
2. Variability of eGFR within the normal range may reflect early functional changes.
3. Further longitudinal studies are required to assess long-term renal effects of COVID-19 in initially healthy patients.

Literature

1. Nalbandian, A. Post-acute COVID-19 syndrome / A. Nalbandian [et al.] // *Nature Medicine*. – 2021. – Vol. 27. – P. 601–615.
2. Huang, C. 6-month consequences of COVID-19 in patients discharged from hospital / C. Huang [et al.] // *The Lancet*. – 2021. – Vol. 397. – P. 220–232.
3. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. – Kidney International. – 2024.
4. Levey, A.S. A new equation to estimate glomerular filtration rate / A.S. Levey [et al.] // *Annals of Internal Medicine*. – 2009. – Vol. 150. – P. 604–612.
5. Su, H. Renal histopathological analysis of patients with COVID-19 / H. Su [et al.] // *Kidney International*. – 2020. – Vol. 98. – P. 219–227.