



EARLY DIAGNOSTIC MARKERS OF CHRONIC KIDNEY DISEASE DEVELOPMENT IN WOMEN WITH A HISTORY OF PREECLAMPSIA

Khudayberganova Aziza Akbar kizi

master

Jabbarov Ozimbay Otakhanovich

DSc. professor, scientific director

Nazarova Nigina Otabekovna

PhD

No. 2 Department of Faculty and hospital therapy, nephrology and hemodialysis Tashkent State Medical University (Tashkent, Uzbekistan)

<https://doi.org/10.5281/zenodo.17656778>

ARTICLE INFO

Received: 17th November 2025

Accepted: 18th November 2025

Online: 19th November 2025

KEYWORDS

digitization, modern education, teacher-student relations, teaching

ABSTRACT

This article lists the advantages of digitalization, which is becoming a modern requirement. At the same time, in the digital education system, the teacher-student relationship reveals that it plays a very important role and influence in the educational process.

Introduction. Preeclampsia (PE) is a multisystem hypertensive disorder of pregnancy characterized by endothelial dysfunction, renal involvement, and placental ischemia. [1] Numerous studies indicate that women with a history of preeclampsia are at significantly increased risk for the later development of chronic kidney disease (CKD).[2] Persistent microvascular injury, glomerular endotheliosis, and altered renal autoregulation often continue postpartum, creating a predisposition to progressive renal dysfunction. This study focuses on identifying early diagnostic markers that can predict CKD development in this high-risk population.[3]

Aim. The aim of this study is to evaluate early clinical, biochemical, and imaging markers indicative of chronic kidney disease development in women with a previous history of preeclampsia, with emphasis on early detection strategies for preventing long-term renal complications.

Materials and Methods.

A cohort of 50 women aged 20-45 years, 6-36 months postpartum after documented preeclampsia, was assessed. Renal function was evaluated using serum creatinine, cystatin C, eGFR (CKD-EPI), and urine albumin-creatinine ratio (ACR). Biomarkers of endothelial dysfunction (sFlt-1, PlGF, ADMA), tubular injury markers (NGAL, KIM-1), and inflammatory markers (CRP, IL-6) were measured. Doppler ultrasonography was used to assess renal resistive index (RRI), while 24-hour ambulatory blood pressure monitoring evaluated persistent hypertension or high-normal pressures.

Results.

Early renal abnormalities were identified in 21 of 50 patients (42%). Microalbuminuria (>30 mg/g) was present in 15 women (30%), while subtle reductions in eGFR (<90

mL/min/1.73 m²) were found in 12 women (24%). Elevated cystatin C levels were observed in 10 women (20%), outperforming creatinine in early detection. Increased RRI (>0.70) was present in 14 patients (28%), indicating ongoing microvascular impairment. Biomarkers such as sFlt-1/PlGF ratio and NGAL were significantly higher in women demonstrating early renal dysfunction ($p<0.05$). Persistent elevated systolic blood pressure (>130 mmHg) or masked hypertension was observed in 18 women (36%), correlating strongly with renal injury markers.

Discussion.

The findings confirm that women with a history of preeclampsia frequently exhibit early signs of CKD within three years postpartum. Microalbuminuria, elevated cystatin C, and increased RRI emerge as the most sensitive early markers. Persistent endothelial dysfunction and subclinical inflammation play a crucial role in the pathogenesis of postpartum renal impairment. Incorporating these indicators into routine follow-up can facilitate early recognition, allowing timely nephroprotective interventions and targeted cardiovascular risk reduction.

Conclusion.

Women with previous preeclampsia constitute a high-risk group for developing chronic kidney disease. Routine postpartum screening using sensitive biochemical markers, blood pressure monitoring, and renal Doppler imaging should be integrated into clinical practice for early detection. Early identification enables prevention of progressive renal damage and improves long-term health outcomes.

References:

1. Garovic, V. D., & August, P. (2016). Preeclampsia and the kidney. *Nature Reviews Nephrology*, 12(3), 106–116.
2. Vikse, B. E. (2013). Pre-eclampsia and the risk of kidney disease. *The Lancet*, 382(9897), 104–106.
3. Brown, M. C., et al. (2013). Long-term risk of CKD after hypertensive pregnancy disorders. *BMJ*, 347, f5734.