Georgian Scientists
ქართველი მეცნიერები
Vol. 8 Issue 4(1), 2026
https://doi.org/10.52340/gs.2026.08.04(1).56



PROGNOSTIC SIGNIFICANCE OF THE ASSOCIATION BETWEEN CLINICAL AND LABORATORY PARAMETERS AND BREAST CANCER MARKERS IN ATHEROSCLEROSIS-INDUCED CHRONIC KIDNEY DISEASE (CKD)

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Chronic kidney disease (CKD) and cardiovascular disease (CVD) are closely interrelated, and their coexistence is associated with an increased risk of complications and adverse clinical outcomes. Patients with breast cancer, particularly carriers of BRCA1/2 mutations, may also have an increased risk of cardiovascular and metabolic abnormalities. The BRCA1 protein plays a critical role in DNA repair, cell-cycle regulation, and antioxidant defense. Emerging evidence suggests that alterations in BRCA1 function may be involved not only in tumorigenesis but also in the pathophysiology of cardiovascular and renal injury. SUMO-specific cysteine proteases, particularly SENP1 and SENP2, may also play a potential role in these interconnected pathological processes.

The aim of this study is to evaluate the potential clinical and prognostic significance of BRCA1 protein and SENP1/SENP2 biomarkers at different stages of atherosclerosis-induced CKD associated with coronary artery disease (CAD), and to investigate their potential relationship with disease progression and renal dysfunction.

A comprehensive assessment of clinical and laboratory parameters is planned. The study cohort will be formed based on clinical symptoms, objective findings, medical history, relevant documentation confirming CKD, and disease staging. Renal function, including estimated glomerular filtration rate (eGFR), cardiovascular risk factors, and electrocardiographic and echocardiographic parameters will be assessed. Biomarker analysis will include determination of BRCA1 protein, SENP1, and SENP2 levels. The obtained data will be compared among relevant study groups. Potential associations with age, overweight, physical activity, dietary factors, dyslipidemia, smoking, alcohol consumption, arterial hypertension, and genetic risk factors will also be evaluated.

The study is expected to identify potential associations between BRCA1, SENP1, and SENP2 biomarker levels and impaired renal function, cardiovascular disease, and disease progression.

Comparative assessment of biomarker dynamics and changes in eGFR may contribute to the identification of early renal impairment and patients at increased risk of disease progression. The findings may also provide insight into the potential relationship between molecular biomarkers and conventional cardiovascular and renal risk factors.
Investigation of the BRCA1 and SENP1/SENP2 pathways may provide additional insight into the interconnected pathophysiological mechanisms underlying breast cancer, atherosclerotic cardiovascular disease, and CKD. Determining the potential diagnostic and prognostic value of these biomarkers may contribute to the early identification of high-risk patients, more precise monitoring of disease progression, and the development of individualized preventive and therapeutic strategies. Further investigation is warranted to establish the clinical applicability of these biomarkers and their role in risk stratification and longitudinal patient management.

Keywords: Chronic Kidney Disease, Atherosclerosis, Coronary Artery Disease, BRCA1, SENP1, SENP2, eGFR, Cardiovascular Disease.