Role of novel biomarkers in risk assessment and prognosis of hypertensive heart disease.

Ali Boskabadi*

Department of Pediatrics, Mashhad University of Medical Sciences, Mashhad, Iran

Introduction

Hypertensive heart disease (HHD) is a prevalent condition characterized by chronic high blood pressure that affects the heart and leads to various cardiac complications. Identifying patients at high risk of developing HHD and predicting their prognosis is crucial for effective management and personalized treatment strategies. Traditional risk assessment methods often rely on clinical parameters, such as blood pressure measurements and imaging techniques. However, recent advancements in the field of precision medicine have shed light on the potential role of novel biomarkers in enhancing risk assessment and prognosis prediction for HHD patients. This article explores the emerging role of these biomarkers and their implications in improving patient outcomes [1].

Traditional risk assessment models for HHD mainly consider age, gender, blood pressure levels, and the presence of comorbidities. While these factors provide valuable information, incorporating novel biomarkers can offer a more comprehensive assessment of an individual's risk. Biomarkers such as high-sensitivity troponins, natriuretic peptides, and galectin-3 have shown promise in identifying patients at higher risk of developing HHD. High-sensitivity troponins, for example, are markers of myocardial damage and have been associated with adverse cardiac events. Natriuretic peptides, particularly B-type natriuretic peptide (BNP) and N-terminal pro-B-type natriuretic peptide (NT-proBNP), reflect cardiac strain and can indicate the presence and severity of heart failure [2].

Galectin-3, a marker of cardiac fibrosis and inflammation, has emerged as a potential predictor of adverse cardiovascular outcomes. Integrating these biomarkers into risk assessment models can help identify individuals who may benefit from early intervention and intensive management strategies. Prognosis prediction plays a crucial role in tailoring treatment approaches and optimizing patient outcomes in HHD. Novel biomarkers offer valuable insights into disease progression, response to therapy, and overall prognosis. Cardiac imaging biomarkers, such as cardiac magnetic resonance imaging (MRI) and speckle-tracking echocardiography, provide detailed information on cardiac structure, function, and remodeling [3].

These imaging techniques enable the identification of subclinical cardiac abnormalities and help predict future cardiovascular events. Additionally, biomarkers like soluble suppression of tumorigenicity 2 (sST2), growth differentiation factor-15 (GDF-15), and microRNAs have shown promise in prognosticating adverse outcomes in HHD patients. Elevated levels of sST2 and GDF-15 have been associated with increased cardiovascular mortality and heart failure progression. MicroRNAs, small non-coding RNA molecules, exhibit altered expression patterns in HHD and hold potential as prognostic markers. By incorporating these novel biomarkers into prognostic models, clinicians can better assess disease progression, predict outcomes, and adjust treatment strategies accordingly [4].

The integration of novel biomarkers into risk assessment and prognosis prediction of HHD has important clinical implications. By identifying patients at high risk of developing HHD and those with poor prognosis, clinicians can implement targeted interventions and intensify therapy to prevent disease progression and reduce cardiovascular events. Furthermore, the use of biomarkers allows for a more personalized approach to treatment, enabling the selection of therapies that specifically target underlying pathophysiological processes. This approach can potentially improve patient outcomes, enhance quality of life, and optimize healthcare resource allocation. However, further research is needed to validate the utility of these biomarkers in large-scale clinical trials and to establish standardized cut-off values for risk stratification and prognostication. Additionally, the development of multiplex biomarker panels and integration with advanced technologies, such as artificial intelligence and machine learning algorithms, may further enhance risk assessment and prognosis prediction models in HHD [5].

Conclusion

Novel biomarkers offer promising opportunities for enhancing risk assessment and prognosis prediction in hypertensive heart disease. By incorporating these biomarkers into clinical practice, clinicians can identify individuals at higher risk of developing HHD and predict adverse cardiovascular outcomes with greater accuracy. This information allows for tailored interventions, intensification of therapy, and more personalized treatment strategies. However, further research is necessary to validate the utility of these biomarkers and establish standardized cut-off values. The future integration of advanced technologies and multiplex biomarker panels may further enhance the precision and effectiveness of risk

***Correspondence to:** Ali Boskabadi, Department of Pediatrics, Mashhad University of Medical Sciences, Mashhad, Iran E-mail: boskabadia@mums.ac.ir

***Received:** 25-May-2023, Manuscript No. AAJHHC-23-103094; **Editor assigned:** 27-May-2023, PreQC No. AAJHHC-23-103094 (PQ); **Reviewed:** 03-Jun-2023, QC No. AAJHHC-23-103094; **Revised:** 15-Jun-2023, Manuscript No. AAJHHC-23-103094 (R); **Published:** 20-Jun-2023, DOI:10.35841/aajhhc-6.3.149*

***Citation:** Boskabadi A. Role of novel biomarkers in risk assessment and prognosis of hypertensive heart disease. J Hypertens Heart Care.2023;6(3):149*

assessment and prognosis prediction in HHD, ultimately leading to improved patient outcomes.

References

1. Beckett NS, Peters R, Fletcher AE, et al. Treatment of hypertension in patients 80 years of age or older. N Engl J Med. 2008;358(18):1887-98.
2. Shehab M, Abualigah L, Shambour Q, et al. Machine learning in medical applications: A review of state-of-the-art methods. Comput Biol Med. 2022;145:105458.
3. Kjeldsen L, Johnsen AH, Sengeløv H, et al. Isolation and primary structure of NGAL, a novel protein associated with human neutrophil gelatinase. J Biochem. 1993;268(14):10425-32.
4. Simonneau G, Torbicki A, Dorfmüller P, et al. The pathophysiology of chronic thromboembolic pulmonary hypertension. Eur Respir Rev. 2017;26(143).
5. Pack AI. Advances in sleep-disordered breathing. Am J Respir Crit Care Med. 2006;173(1):7-15.

Citation: *Boskabadi A. Role of novel biomarkers in risk assessment and prognosis of hypertensive heart disease. J Hypertens Heart Care.2023;6(3):149*