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**EVOLIUCINĖ MEDICINA:
ŽMOGAUS RAIDOS PERSPEKTYVOS IR SVEIKATA
BESIKEIČIANČIOJE APLINKOJE**

**EVOLUTIONARY MEDICINE:
PERSPECTIVES ON HUMAN DEVELOPMENT AND HEALTH
CONSEQUENCES IN A CHANGING ENVIRONMENT**

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BIOMARKERS OF AORTIC STENOSIS PROGRESSION: CLINICAL SIGNIFICANCE OF INFLAMMATION, CALCIFICATION AND MYOCARDIAL REMODELLING

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Background and Aim: Calcific aortic stenosis is the most common acquired valvular heart disease in older adults, and its burden is increasing with population ageing. Although severity is mainly assessed by echocardiography, haemodynamic parameters do not fully explain individual differences in progression. This narrative review summarised recent evidence on biomarkers of aortic stenosis progression and their value for assessing disease activity, myocardial injury and clinical risk.

Materials and Methods: A structured narrative review was performed using PubMed/MEDLINE, Web of Science Core Collection and Scopus. Original studies, systematic reviews, meta-analyses, European guidelines and expert consensus documents published in 2020–2026 were analysed. Sources were selected according to three pathogenic domains: inflammation, calcification and myocardial remodelling.

Results: The most promising biomarkers of aortic stenosis activity are related to valvular calcification. Lipoprotein(a) [Lp(a)] and oxidised phospholipids show the strongest prognostic potential, as they are associated with faster valve calcification and greater increases in transvalvular velocity and pressure gradient. Inflammatory markers, especially C-reactive protein (CRP), reflect systemic inflammation but lack specificity for predicting individual progression. Cytokine profiles may provide additional information but require prospective validation. Biomarkers of myocardial remodelling, including B-type natriuretic peptide (BNP), N-terminal pro-B-type natriuretic peptide (NT-proBNP) and high-sensitivity cardiac troponins (hs-cTn), primarily reflect left ventricular pressure overload, fibrosis, subclinical decompensation and adverse clinical risk rather than valvular narrowing alone.

Conclusions: Aortic stenosis progression is heterogeneous and should not be assessed using echocardiographic parameters alone. Lp(a) and calcification-related markers best reflect valvular disease activity, whereas natriuretic peptides and troponins reflect myocardial response and clinical risk. Integrated, standardised and prospectively validated prognostic models combining laboratory biomarkers and imaging findings may help identify high-risk patients earlier, individualise follow-up and optimise intervention timing.

Keywords: aortic stenosis, biomarkers, lipoprotein(a), calcification, myocardial remodelling