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INFLAMMATORY AND CARDIAC BIOMARKERS AS PREDICTORS OF HIGH CARDIOVASCULAR RISK IN ADULTS OVER 30 YEARS OF AGE

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Background. Cardiovascular diseases (CVD) caused 18.6 million deaths worldwide in 2019. According to the revised WHO risk charts, the same risk profile corresponds to a 10-year risk of 11% in Andean Latin America and 30% in Central Asia, one of the highest-risk regions. Conventional 10-year scores underestimate risk in adults aged 30–50, so biomarkers that reflect the inflammatory and myocardial components of atherosclerosis are of growing interest.

Aim. To summarise current evidence on inflammatory and cardiac blood biomarkers as independent predictors of high cardiovascular risk in adults over 30 years of age.

Materials and methods. A narrative evidence synthesis of prospective cohort studies, randomised trials and individual-participant meta-analyses published in 2015–2026 and indexed in PubMed/PMC and Crossref was performed. The existence and bibliographic data of each publication were verified by DOI and PMID, and quantitative results were taken from the original abstracts or full texts.

Results. In the Women's Health Study (27,939 women, 30-year follow-up), a single high-sensitivity C-reactive protein (hs-CRP) measurement predicted major cardiovascular events at least as strongly as LDL cholesterol and lipoprotein(a) (top vs bottom quintile: HR 1.70 vs 1.36 and 1.33); when all three markers were elevated, risk rose 2.63-fold [1]. Among 31,245 statin-treated patients, residual inflammation predicted cardiovascular death more strongly than residual LDL cholesterol (HR 2.68 vs 1.27) [2]. In the Russian ESSE-RF cohort (10,421 adults aged 25–64), hs-CRP independently predicted cardiovascular events, and the optimal cut-offs (1.54 in men and 1.89 in women) were below the conventional 3 mg/L [3]. Among cardiac markers, high-sensitivity troponin in the top third of its distribution was associated with a 1.43-fold higher risk of first CVD events in 154,052 participants [4], and NT-proBNP with a 1.76-fold higher risk of coronary heart disease and stroke in 95,617 participants, providing one of the largest gains in the C-index among single biomarkers [5]. The neutrophil-to-lymphocyte ratio, derived from a routine blood count, increased the risk of major cardiovascular events by 9–31% per quartile in five randomised trials [6].

Conclusions. Inflammatory (hs-CRP, neutrophil-to-lymphocyte ratio) and cardiac (high-sensitivity troponin, NT-proBNP) biomarkers independently predict cardiovascular events and are most useful for reclassifying adults at intermediate risk. Evidence from post-Soviet populations suggests lower hs-CRP thresholds, while data from Uzbekistan and other Central Asian countries are lacking. Prospective validation of a combined clinical and biomarker model in Central Asian adults over 30 is warranted.

Keywords: *cardiovascular risk, C-reactive protein, troponin, NT-proBNP, neutrophil-to-lymphocyte ratio, Central Asia.*

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