

TREM-1 and CRP as Inflammatory Mediators of Vascular Stiffness in Individuals with Cardiovascular Risk Factors

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Background: Cardiovascular stiffness is a critical factor contributing to cardiovascular disease (CVD). Chronic inflammation is increasingly recognized as a driving force in the development and progression of CVD. Triggering receptors expressed on myeloid cells-1 (TREM-1) and marker C-reactive protein (CRP) are key contributors to endothelial dysfunction and arterial stiffness and may provide insights into the pathogenesis of vascular stiffness. The purpose of this study is to investigate the relationship between inflammatory markers (TREM-1 and CRP) and arterial stiffness.

Methods: Adults with cardiovascular disease (N=40) were enrolled in this ongoing cross-sectional study. Three participants were excluded from the analysis of pulse wave velocity (PWV) due to incomplete data. Serum TREM-1 and CRP levels were quantified using ELISA. Vascular stiffness was assessed through PWV measurements. Pearson correlation analysis was performed to assess associations between TREM-1, CRP, PWV, and cardiovascular biomarkers ($\alpha=0.05$).

Results: Participants were aged 66 ± 8 years, majority female (55%), BMI 30.4 ± 7.2 m/kg², and 16 ± 3 years of education. TREM1 concentrations were positively correlated with PWV ($r=0.420$, $p=0.0097$) and CRP ($r=0.478$, $p=0.002$), and negatively correlated with HDL ($r= -0.314$, $p=0.49$). PWV was positively correlated with age ($r=0.327$, $p= 0.048$) and CRP ($r=0.334$, $p=0.043$).

Conclusions: Preliminary findings suggest TREM-1 and CRP may contribute to vascular stiffness in CVD and may serve as potential biomarkers of inflammation in CVD risk, warranting their relevance as both diagnostic indicators and therapeutic targets for managing cardiovascular risk.

Implications for Practice: Nurses can play a key role in promoting cardiovascular health through early assessment of inflammatory markers, such as TREM-1 and CRP, in routine care. Interventions aimed at reducing inflammation can contribute to improved management of cardiovascular disease progression.