Characterization Of Plasma Oxidative Stress and Inflammatory Biomarkers Levels In Patients With Atrial Fibrillation

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Introduction: Inflammation and oxidative stress have been associated with cardiovascular disease and the burden of atrial fibrillation (AF). Inflammation has been implicated in various AF-related pathological processes, including oxidative stress, fibrosis, and thrombogenesis. There were associated with increased mortality and morbidity in atrial fibrillation (AF). The aims of this study to examined inflammatory biomarkers and plasma oxidative status in patients with AF.

Methods: It was observational analytic with case control design, inflammatory biomarkers and plasma oxidative status were compared between 38 patients with atrial fibrillation and 29 control patients. They were matched for age, sex, diabetes, and smoking status, known confounding variables for the measurement of oxidative stress and inflammatory marker. AF was determined at baseline by self-report (medical record) and electrocardiogram (ECG). We used superoxide dimutase (SOD), malondialdehyde (MDA) concentration to quantify oxidative stress. We also measured inflammatory markers, including high-sensitivity C-reactive protein, interleukins 1 and 6, and tumor necrosis factor.

Result: The inflammatory markers IL-1, IL-6, and TNF-α were significantly higher in the AF group compared with controls (4.44 ± 1.72 vs 3.5 ± 0.69, p=0.006; 91.3 ± 31.2 vs 76.44 ± 22.4, p=0.033; 4.16 ± 2.36 ±3.09±1.55, p=0.039, respectively). SOD was significantly lower in AF group compared with control (2.35 ± 0.85 vs 2.81 ± 0.68, p=0.018, respectively), MDA was significantly higher in AF group compared with control (23.24±13.6 vs 17.7±7.08, p=0.039), interestingly, there was no difference in HsCRP level between AF group compared with placebo. In subgroup analysis, Persistent AF patients had a higher HsCRP level (38.3±7.19) than paroxysmal AF patients (27.50 ± 10.6; P=0.026), both groups had higher HsCRP levels than controls (P=0.014). HsCRP level was a predictor of rehospitalization in AF patient (OR=1.267, 95%CI 1.004-1.59, P=0.034).

Conclusion: In this study, we suggest that levels of circulating biomarkers of inflammation and oxidative stress, oXLDL, were higher AF patients compared to control. HsCRP was higher in persistent AF compared with paroxysmal AF. Although the cause of elevated HsCRP levels in AF patients remains unknown, elevated of HsCRP level was a predictor for rehospitalization in atrial fibrillation.