Strategies for Developing Biomakers of Heart Failure

Saeed A. Jortani, Sumanth D. Prabhu, Roland Valdes, Jr.

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Background: Heart failure (HF) is a devastating disease with increasing prevalence in elderly populations. One-half of all patients die within 6 years of diagnosis. The annual cost of treating patients with HF in the US is more than $20 billion, which is estimated to be greater than that of myocardial infarction and all cancers combined. Given the complex pathophysiology and varied manifestations of HF, interest has intensified in developing biological markers to predict susceptibility and aid in the early diagnosis and management of this disease.
Methods: We searched Medline via Ovid for studies published during the period 1966-2003 regarding various biomarkers suggested for HF. Our review focused on developing strategies for discovering and using new biomarkers, particularly those potencially linked to pathophysiologic mechanisms. We also point out strategic advantages, limitations, and methods available for measuring each of the currently proposed markers.
Results: Biomarkers reviewed include those released from the heart during normal homeostasis (natriuretic peptides), those produced elsewhere that act on the heart (endogenous cardiotonic steroids and other hormones), and those released in response to tissue damage (inflammatory cytokines). The concept of using a combination of multiple markers based on diagnosis, prognosis, and acute vs chronic disease is also discussed. In view of recent advances in our understanding of molecular biochemical derangementes observed during cardiac failure, we consider the concept of myocardial remodeling and the heart as part of endocrine system as strategics.
Conclusion: Strategically, biomarkers linked to mechanisms involved in the etiology of HF, such as dysregulation of ion transport, seem best suited for serving as early biological markers to predict and diagnose disease, select therapy, or assess progression.

Supplementation With ϖ3 Polynunsaturated Fatty Acids and *all-rac* Alpha-Tocopherol Alone and in Combination Failed to Exert an Anti-inflammatory Effect in Human Volunteers

Sonia Vega-López, Nalini Kaul, Sridevi Devaraj, Ru Ya Cai, Bruce German, Ishwarial Jialal

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There is growing evidence supporting the importance of inflammation in all stages of atherosclerosis. While both ϖ3 polyunsaturated fatty acids (n3PUFA) and the lipid-soluble antioxidant (AT) have been shown to independently have significant anti-inflammatory effects, there is paucity of data examining the effect of n3PUFA alone and in combination with AT on markers of inflammation and monocyte function. Therefore, we tested the effect of n3PUFAalone, *all-rac* (synthetic) AT alone, and the combination on markers of inflammation and monocyte function. Healthy nonsmoking volunteers were randomly assigned to 1 of 4 groups (n – 20 per group): 1.5 g/d n3PUFA, 800 IU/d AT, 1.5 g n3PUFA + 800 IU/d AT, or placebo in a paralle double-blinded study. Compared to baseline, 12 weeks of supplementation resulted in no changes in plasma lipids regardless of treatment. Plasma AT was significantly increased only in those groups that received AT (P<.0001). Similarly, groups receiving n3PUFA showed a significant increase in plasma docosahexaenoic acid (P< .0001). No significant within or between-group differences were found for plasma levels of high-sensitivity C-reactive protein necrosis factor [TNF]-α and IL-6 after activation with monocyte chemotactic protein -1 (MCP-1). In conclusion, supplementation with n3PUFA and *all-rac* AT at these doses is not anti-inflammatory.