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CARDIAC FUNCTION AND HEART FAILURE

ENHANCED INTERLEUKIN-1 ACTIVITY IN PLASMA OF PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE

ACC Poster Contributions
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Background: Interleukin-1b (IL-1b) is an inflammatory cytokine that suppresses cardiac contractility in cellular and animal models, referred to as circulating myocardial suppressant factor in sepsis. We hypothesize that increased plasma IL-1b activity in patients with acute decompensated heart failure (ADHF) may contribute to impaired cardiac function.

Methods: Adult mice (N=5 per group) underwent baseline echocardiography to measure left ventricular ejection fraction (LVEF) and then 4 hours after receiving either plasma derived from healthy controls (0.2 mL), recombinant murine IL-1b (0.3 mcg/kg), or plasma from patients admitted with ADHF (0.2 mL), with or without pre-treatment with anakinra (recombinant human IL-1 receptor antagonist [10 mg/kg]).

Results: Mice given recombinant IL-1b or plasma from patients with ADHF had significantly depressed LV systolic function at 4 hours after injection (LVFS reduction of 27% +/- 4% and 25 +/- 4%, respectively, P<0.05 versus baseline) when compared to mice receiving plasma from healthy controls. Pretreatment with anakinra prevented the systolic dysfunction (LVFS reduction of 2%, P<0.05 versus IL-1b or ADHF) seen in mice given the plasma from patients with ADHF, suggesting that the plasma of ADHF had sufficient IL-1 activity to induce systolic dysfunction.

Conclusions: Patients with ADHF have enhanced plasma IL-1 activity which may contribute to impaired function. IL-1 blockade may represent a novel approach for the prevention or treatment of ADHF.