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BACKGROUND
Matrix metalloproteinase (MMP) protein activity are upregulated in the failing human heart, and have been demonstrated to influence left ventricular remodeling. However, there are few reports describing the role of elevated level of circulating MMPs in chronic heart failure (CHF) patients. This study examined whether circulating MMPs are also related to the pathogenesis of CHF.

METHODS: Serum samples were obtained from 69 consecutive patients with CHF (Average age was 67.1 ± 10.5, LVEF<50%, NYHA II-III), and analyzed circulating levels of matrix metalloproteinase-9 (MMP-9), tissue inhibitors of MMP-1(TIMP-1), norepinephrine (NE), A-type natriuretic peptides (ANP), B-type natriuretic peptides (BNP), and cytokines (interleukin(IL)-1beta, IL-6 and tumor necrosis factor-alpha(TNF- alpha)). Age-matched 15 healthy volunteers were used as controls.

RESULTS:
The circulating levels of MMP-9 and TIMP-1 were significantly higher in CHF than in controls (76.6 ±16.6 vs 20.6 ± 4.1ng/dl , P<0.01, 146.0±7.0 vs 99.4±15.3 , P<0.01). In CHF, circulating levels of MMP-9 were increased as increasing NYHA class.,but TIMP-1 were not differ among NYHA class.Circulating levels of MMP-9 have significant positive correlations with both levels of IL-6 and TNF-alpha, and sinverted correlations with LVEF in CHF patients. All patients were treated with ordinary regimen and were observed up for an average of 48.5months. Cardiac event was defined as all death and rehospitalization due to worsening heart failure. Patients with events had higher circulating levels of MMP-9 compared with those without events(P=0.08).

CONCLUSIONS: Our data showed that the circulating MMP-9 levels was increased in CHF patients and that the levels were related to the inflammatory cytokine in CHF, suggesting that the elevated MMP-9 levels are related to developing heart failure syndrome.