Brachial Artery Endothelial Function Predicts Mortality Risk in Patients with Advanced Ischemic Chronic Heart Failure

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Background While endothelial function is impaired in chronic heart failure (CHF) patients, its association with mortality risk has not been reported.

Methods We prospectively assessed brachial flow-mediated dilation (FMD) in 82 consecutive advanced (New York Heart Association [NYHA] class IV) ischemic CHF patients with left ventricular ejection fraction (LVEF) 22±3%. Following overnight fasting and discontinuation of all medications for ≥ 12 hours, percent improvement in FMD (%FMD) and nitroglycerin-mediated vasodilation (%NTG) were assessed using high resolution (15 MHz) linear array ultrasound. All patients were followed for 14±2 months for pre-specified combined adverse cardiovascular events, including death, hospitalization for CHF exacerbation or myocardial infarction.

Results Subjects were divided into 2 groups: ≤ (n=41) and > (n=41) the median %FMD of 4.6%. Both groups were comparable regarding risk factors, LVEF, lipids, glucose, electrolytes, hemoglobin, creatinine clearance, and concomitant medications. During follow-up 22 (53.6%) patients with FMD ≤ had composite adverse cardiovascular events compared with only 8 (19.5%) with FMD > the median ($p<0.01$). Furthermore, 5 deaths (12.1%) occurred in patients with FMD ≤, compared with no deaths in FMD > the median ($p<0.03$) (Figure). Cox regression analyses revealed that FMD was an independent predictor for these events.

Conclusions FMD is associated with increased mortality risk in NYHA class IV ischemic CHF patients.

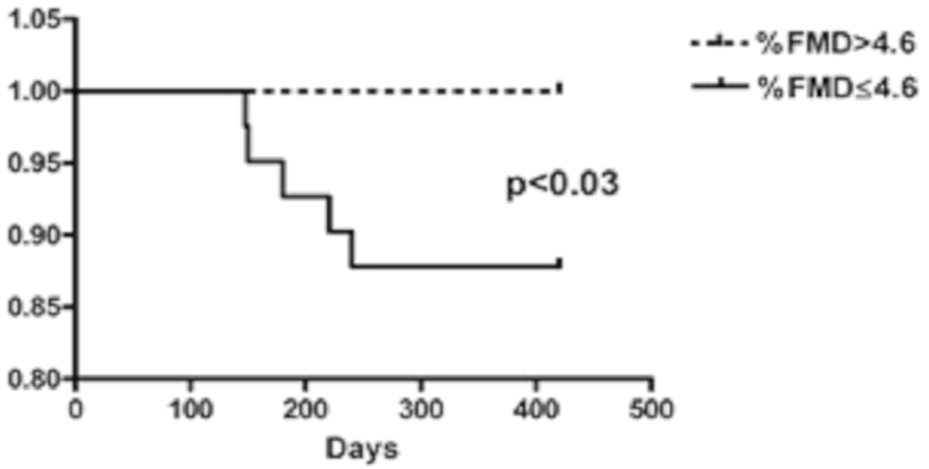

Figure: Kaplan-Meier plot showing proportion of survivors over time in advanced NYHA class IV CHF patients with FMD of the brachial artery > (dashed line) and ≤ (solid line) median value of 4.6%. Patients with FMD ≤ the median had higher mortality compared to those above the median (5 vs 0 events; $p<0.03$, by long-rank test).