Results: At baseline, we observed an inverse correlation between Si and fasting plasma insulin (r = 0.44, p < 0.001), BMI (r = -0.42, P = 0.002), plasma urate (r = -0.42, P = 0.002), plasma triglycerides (r = -0.34, P = 0.01) and fasting plasma glucose levels (r = -0.25, P = 0.03). Furthermore, a positive correlation was noted for Si and plasma HDL cholesterol levels (r = 0.39, P = 0.01) and maximal oxygen uptake (r = 0.35, P = 0.009) was found. The Si did not correlate with NYHA class, W/H ratio, age, EF, or plasma catecholamine levels. A trend towards an inverse correlation between insulin sensitivity and plasma endothelin was seen (r = 0.26, P = 0.056). Si was unchanged both within the carvedilol group from 2.63 ± 1.45 to 2.38 ± 1.64 * 10^-4 * mm^-1/mU^-1 * L^-1 (NS) and compared with the placebo group (−0.25 vs. −0.33 ± 1.04 * 10^-4 * mm^-1/mU^-1 * L^-1, NS).

Conclusion: Additional treatment with carvedilol to patients with mild to moderate CHF is neutral with regard to influence insulin sensitivity. Further prospective studies may show how selective beta-blockers affect the insulin sensitivity in patients with CHF.

Vitamin C acutely improves ejection duration in chronic heart failure (CHF) patients in a heart rate independent fashion


Background: Shortened ejection duration (ED) in chronic heart failure (CHF) correlates with stroke work index and fractional shortening and is inversely related to pulmonary capillary wedge pressure. ED is determined both by intrinsic myocardial function and also by the effects of the reflected aortic pressure wave. Increased pulse wave velocity (PWV) due to increased large artery stiffness results in earlier return of the pressure wave and may contribute to early aortic valve closure. We hypothesized that by improving endothelial function and reducing PWV, vitamin C would prolong ED in patients with CHF.

Methods: 40 CHF patients with an ejection fraction (EF) of less than 35% (21 NYHA II and 19 NYHA III) were studied. Pulse wave analysis (PWA) was performed with the SphygmoCor® (PWV Medical) device which uses a high fidelity tonometer to record a radial pressure trace from which central aortic pressures and ED can be accurately estimated applying a generalized transfer factor. ED measurements have been validated against invasive recordings. Baseline recordings were performed after 10 minutes of supine rest. 30 patients were randomised in a double blind parallel group fashion to receive either 2 g vitamin C or N-Saline i.v. PWA was performed 30 minutes later.

Results: Data are expressed as mean ± SEM. ED was 282 ± 5 msec at baseline and was shorter in NYHA III vs NYHA II patients (ED 271 ± 8 msec vs 290 ± 4 msec; p = 0.03). Vitamin C prolonged ejection duration from 284 ± 5 msec to 298 ± 6 msec; p = 0.0005 vs baseline, p = 0.016 vs placebo. When ED was corrected for heart rate (HR) these changes remained very significant; p = 0.008 at baseline, p = 0.007 vs placebo.

Conclusions: 1. In CHF ejection duration is reduced in parallel with the reduction in functional capacity (NYHA class). Vitamin C gives intravenously prolongs ED. This might theoretically be due to either a myocardial effect or a delay in wave reflection as a result of improved large artery endothelial function. 3. PWA can be used to determine accurately the effects of pharmacological interventions on ventricular-vascular coupling.