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Activity : Abstract

D-Ribose Supplementation Improves Peak Exercise Capacity and Ventilatory Efficiency in Heart Failure Patients

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Background: Many clinicians and scientists concur that the failing heart is energy starved. D-Ribose (dR), a naturally occurring monosaccharide, has been shown to increase myocardial high-energy phosphate stores and improve post-ischemic myocardial function in humans. This study was designed to determine whether dR could improve maximal exercise capacity and ventilatory efficiency, a powerful independent predictor of heart failure (HF) survival, in subjects with NYHA II-III HF.

Methods: Fourteen subjects with HF of ischemic etiology (LVEF: 32.4±8.1) completed a single-center study, using a randomized, double-blind, placebo-controlled (PL), cross-over design. Each subject underwent maximal cycle ergometry with gas exchange monitoring, quality of life (QOL, DASI questionnaire), and BNP levels at baseline and the end of each 8-week cross-over phase with a 2-week washout phase. Ventilatory efficiency was assessed using the linear VE to VCO₂ slope. dR or PL was administered on a 5 gram TID schedule in addition to standard systolic HF drug regimens.

Results: dR significantly maintained VO₂max vs. PL, while improving the VE/VCO₂ relationship, up to the respiratory compensation point (RCP), and the RCP. (Table 1) There was no significant difference in QOL scores or BNP levels.

Conclusions: dR maintains maximal exercise capacity while improving ventilation efficiency, a strong predictor of HF survival, in NYHA II-III HF. dR may offer adjunctive, metabolic therapy for HF.

	VO₂max (%change) [mean±SD]	VE/VCO₂@AT (%change) [mean±SD]	RCP (%change) [mean±SD]
D-Ribose	-1.4±8.5 (p=0.02 vs. PL)	4.9±-6.4 (p=0.08 vs. PL)	5.8±9.8 (p=0.03 vs. PL)
Placebo	-7.8±7.3	-6.9±9.1	-1.4±8.5

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