Letter to the Editor

Why Would the Effect of Beet Root Juice on Exercise Capacity in HFrEF Vary With Etiology?

To the Editor:

We read with interest the work of Coggan et al in the *Journal of Cardiac Failure* (2018;24:65−73) of February of last year[1] with accompanying editorial by Julio Chirinos (2018;24:74−77).[2] Coggan et al reported that patients with heart failure with reduced ejection fraction (HFrEF) had an increase in peak oxygen uptake ($\dot{V}O_2$ peak) and peak power output after ingestion of a concentrated beet root juice supplement in a randomized, double-blind, placebo-controlled, cross-over design. Their findings are consistent with 2 other previous trials in HFrEF patients, also with nonischemic cardiomyopathy.[3,4] In contrast, Hirai et al,[5] in a predominantly ischemic cardiomyopathy HFrEF patient group, reported no change in $\dot{V}O_2$ peak after ingestion of the identical supplement. Both Coggan et al and Chirinos made note of these conflicting results and highlighted the differences in HFrEF etiology between studies.[1,2]

We previously reported an increase in directly measured muscle sympathetic nerve activity (MSNA) at rest in HFrEF patients of ischemic etiology, in addition to a lower $\dot{V}O_2$ peak, compared with HFrEF patients of nonischemic etiology,[6] which may suggest a potential mechanism for these disparate results.[2] The higher sympathetic outflow at rest in ischemic cardiomyopathy patients may reduce the potential for dietary nitrate supplement−induced vasodilation. We subsequently showed that the augmented MSNA at rest is further increased during mild to moderate cycling exercise in a predominately ischemic etiology HFrEF population.[7] Thus the increase in oxygen delivery purported to occur in the nonischemic HFrEF patients of Coggan et al[1] as a result of the dietary nitrate supplement would be counteracted by elevated sympathetic vasoconstriction in the HFrEF patients with ischemic etiology of Hirai et al.[5] Although there is evidence that beet root juice supplementation decreases MSNA in healthy young subjects both at rest and during exercise,[8] this has not been studied in the heart failure population.

Therefore, it is likely that the conflicting results of these studies may indeed be due to etiology differences because of the known differences in sympathetic nervous outflow to skeletal muscle in HFrEF patients with nonischemic versus ischemic etiology.

Disclosures

None.

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