Chronic heart failure does not attenuate the total activity of sympathetic outflow to skin during whole-body heating.


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Abstract

BACKGROUND:
Previous studies show that the rise in skin blood flow and cutaneous vascular conductance during heat stress is substantially attenuated in chronic heart failure (CHF) patients. The mechanisms responsible for this finding are not clear. In particular, little is known regarding the responses of skin sympathetic nerve activity (SSNA) that control the skin blood flow during heat stress in CHF patients. We examined the effects of a modest heat stress to test the hypothesis that SSNA responses could be attenuated in CHF.

METHODS AND RESULTS:
We assessed SSNA (microneurography) from the peroneal nerve and skin blood flow (forearm laser Doppler) in 9 patients with stable class II-III CHF and in matched healthy subjects during passive whole-body heating with a water-perfused suit. Whole-body heating induced similar increases in internal temperature (≈0.6 °C) in both groups. Whole-body heat stress evoked similar SSNA activation in CHF patients (Δ891±110 U/min) and the control subjects (Δ787±84 U/min; P=0.66), whereas the elevation in forearm cutaneous vascular conductance in patients with CHF was significantly lower than that in healthy control subjects (Δ131±29% vs. Δ623±131%; P=0.001).

CONCLUSIONS:
The present data show that SSNA activation during a modest whole-body heat stress is not attenuated in CHF. Thus, the attenuated skin vasodilator response in CHF patients is not attributable to a reduction in total activity of sympathetic outflow to skin.

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