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Impact of Dietary Sodium Restriction on Heart Failure Outcomes

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CME Objective for This Article: After reading this article, the reader should be able to discuss: 1) the clinical characteristics observed in association with sodium restriction; 2) the association between sodium restriction and clinical outcomes in chronic HF patients as observed in the present propensity-matched analysis; and 3) the implications of these data related to clinical practice and future research.

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ABSTRACT

OBJECTIVES This study sought to evaluate the impact of sodium restriction on heart failure (HF) outcomes.

BACKGROUND Although sodium restriction is advised for patients with HF, data on sodium restriction and HF outcomes are inconsistent.

METHODS We analyzed data from the multihospital HF Adherence and Retention Trial, which enrolled 902 New York Heart Association functional class II/III HF patients and followed them up for a median of 36 months. Sodium intake was serially assessed by a food frequency questionnaire. Based on the mean daily sodium intake prior to the first event of death or HF hospitalization, patients were classified into sodium restricted (<2,500 mg/d) and unrestricted (≥2,500 mg/d) groups. Study groups were propensity score matched according to plausible baseline confounders. The primary outcome was a composite of death or HF hospitalization. The secondary outcomes were cardiac death and HF hospitalization.

RESULTS Sodium intake data were available for 833 subjects (145 sodium restricted, 688 sodium unrestricted), of whom 260 were propensity matched into sodium restricted (n = 130) and sodium unrestricted (n = 130) groups. Sodium restriction was associated with significantly higher risk of death or HF hospitalization (42.3% vs. 26.2%; hazard ratio [HR]: 1.85; 95% confidence interval [CI]: 1.21 to 2.84; p = 0.004), derived from an increase in the rate of HF hospitalization (32.3% vs. 20.0%; HR: 1.82; 95% CI: 1.11 to 2.96; p = 0.015) and a nonsignificant increase in the rate of cardiac death (HR: 1.62; 95% CI: 0.70 to 3.73; p = 0.257) and all-cause mortality (p = 0.074). Exploratory subgroup analyses suggested that sodium restriction was associated with increased risk of death or HF hospitalization in patients not receiving angiotensin-converting enzyme inhibitor or angiotensin receptor blocker (HR: 5.78; 95% CI: 1.93 to 17.27; p = 0.002).

CONCLUSIONS In symptomatic patients with chronic HF, sodium restriction may have a detrimental impact on outcome. A randomized clinical trial is needed to definitively address the role of sodium restriction in HF management. (A Self-management Intervention for Mild to Moderate Heart Failure [HART]; NCT00018005) (J Am Coll Cardiol HF 2016;4:24–35) © 2016 by the American College of Cardiology Foundation.

Heart failure (HF) continues to increase in prevalence with an enormous impact on morbidity and mortality (1). The treatment of HF involves both pharmacologic and nonpharmacologic approaches (2). Traditionally, one of the cornerstones of nonpharmacological management in HF has been restricting dietary sodium intake. Data supporting this approach are inconsistent, as some studies have shown benefit (3,4), whereas others demonstrated better outcomes with sodium liberalization (5–7). This controversy has manifested in the American College of Cardiology Foundation (ACCF)/American Heart Association (AHA) guidelines for the management of HF. The 2009 guideline gave sodium restriction in patients with symptomatic HF a Class I recommendation (recommended) to reduce congestive symptoms with Level of Evidence: C (expert consensus) (8). Other societal guidelines issued similar recommendations (9). More recently, the 2013 ACCF/AHA guidelines downgraded the recommendation for sodium restriction to Class IIa (reasonable) with Level of Evidence: C (2).

In this study, we investigated the impact of sodium restriction on HF outcomes in patients enrolled in the HART (Heart Failure Adherence and Retention Trial), a behavioral intervention trial that assessed the efficacy of self-management counseling versus education alone in symptomatic HF patients (10). We hypothesized that if sodium restriction was protective, there would be a difference in clinical outcomes and HF symptoms between patients with low versus high sodium intake.

METHODS

We analyzed data from HART (10), which was a multihospital, partially blinded, behavioral randomized controlled trial, funded by the National Institutes of