

Nutrition in Heart Failure

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ABSTRACT

In spite of remarkable advances in the acute treatment of ischemic events, the prevalence of heart failure is increasing world-wide. Despite improvements in medical and device therapy for heart failure, non pharmacologic interventions are needed to reduce symptoms and improve quality of life. Lifestyle changes are an integral part of treatment and include behavioral changes, exercise and diet. Nutritional therapy in heart failure is aimed at preventing edema due to water and sodium uptake, avoiding difficult digestion and providing adequate and balanced nutrition.

Keywords: Nutrition, Heart Failure, vitamin D, electrolyte imbalances, micronutrients

INTRODUCTION

Heart failure (HF) is a clinical syndrome characterized by structural or functional impairment of ventricular filling or ejection of blood resulting in insufficient perfusion to meet metabolic demands (1-2). Cardinal manifestations include edema, dyspnea, and fatigue (3). In addition to aging of the population, the prevalence of heart failure increases with the progress of invasive and surgical techniques in the acute treatment of ischemic events. Because of these trends, HF is currently considered an epidemic and a public health priority in developed countries (4-5-6). Despite improvements in medical and device therapy for heart failure, non pharmacologic interventions are needed to reduce the symptoms of some of the patients and improve the quality of life. The role of diet and nutrition is increasingly recognized in the prevention and management of HF.

DISCUSSION

In patients with HF, sodium and fluid restriction, avoidance of digestive difficulty, and adequate and balanced nutrition are important (7). Sodium and fluid retention is important in the pathophysiology of heart failure. Sodium dietary restriction (2-3 g / day) is recommended in all patients with symptomatic heart failure. One gram of salt (NaCl) contains 400 mg of sodium (8).

Although limited evidence that gut function is impaired in HF, decreased cardiac function can reduce bowel perfusion and lead to bowel wall edema, resulting in malabsorption. There is an anabolic-catabolic imbalance in these patients which is deepened by neuro-hormonal and immunological factors such as the increase of catecholamine, cortisol and cytokines.

The use of prolonged loop diuretics causes electrolyte imbalances. There is absorption of minerals such as potassium, magnesium and calcium and vitamins such as thiamine is impaired. Reduced potassium value leads to fatigue and several studies have shown that magnesium supplementation reduces ventricular arrhythmia frequency (9-10). Absence of thiamine can cause high output failure and wet beriberi with peripheral vasodilation (11). Patients with heart failure were found to have low serum vitamin D levels as well as excessive calcium excretion. For this reason, the risk of osteoporosis and osteopenia is high in these patients. Vitamin D increases uptake of calcium and increases contractile force and increases muscle cell proliferation. Deficiency of vitamin D can result in a reversible myopathy, decreased muscle mass, and falls (12-13).

In addition to ensuring energy production, the elimination of free oxygen radicals formed is important for the protection of mitochondrial cells. Micro-nutrients are the essential cofactors for energy transfer and heart physiology. Micro

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nutrient demands of a pathologic process such as HF are different from those of the normal myocardium. Some authors suggest the importance of micro nutrients in heart failure for both calcium homeostasis and oxidative stress (9).

CONCLUSION

Nutrition in heart failure treatment is a very important part of the regimen. As in the case of medication, the nutrition regime should be specially arranged for the person.

REFERENCES

- [1] Yancy CW et al: 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol*. 62(16):e147-239, 2013
- [2] McMurray JJ et al: ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC. *Eur J Heart Fail*. 14(8):803-69, 2012
- [3] Heart Failure Society of America et al: HFSA 2010 comprehensive heart failure practice guideline. *J Card Fail*. 16(6):e1-194, 2010
- [4] Teng T-HK, et al: Heart failure: incidence, case fatality, and hospitalization rates in Western Australia between 1990 and 2005. *Circ Heart Fail* 2010; 3: pp. 236-243
- [5] Yeung DF, et al: Trends in the incidence and outcomes of heart failure in Ontario, Canada: 1997 to 2007. *CMAJ* 2012; 184: pp. E765-E773
- [6] Heidenreich PA, et al: Forecasting the impact of heart failure in the United States: a policy statement from the American Heart Association. *Circ Heart Fail* 2013; 6: pp. 606-619
- [7] Chicago Dietetic Association, The South Suburban Dietetic Association and Dietitians of Canada. *Manual of Clinical Dietetics*. USA: American Dietetic Association; Canada: 2000.
- [8] James JE. Critical review of dietary caffeine and blood pressure: a relationship that should be taken more seriously. *Psychosom Med* 2004; 66(1):63-71.
- [9] Witte KK, Clark AL and Cleland JG. Chronic heart failure and micronutrients. *J Am Coll Cardiol* 2001; 37(7):1765-74.
- [10] Jeejeebhoy KN and Sole MJ. Nutrition and the heart. *Clinical Nutrition* 2001; 20(1):181-6
- [11] Zenuk C, et al: Thiamine deficiency in congestive heart failure patients receiving long-term furosemide therapy. *Can J Clin Pharmacol* 2003; 10: pp. 184-188
- [12] Bischoff-Ferrari H.A, et al: Higher 25-hydroxy vitamin D concentrations are associated with better lower-extremity function in both active and inactive persons aged ≥ 60 y. *Am J Clin Nutr* 2004; 80: pp. 752-758
- [13] Houston D.K, et al: Association between vitamin D status and physical performance: the InCHIANTI study. *J Gerontol A Biol Sci Med Sci* 2007; 62: pp. 440-446