

Title:

Sodium-Restricted Diets and Symptoms in End-Stage Renal Disease: A Randomized Controlled Trial

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Session Title:

Improving Nursing Care and Outcomes for Patients Living With End-Stage Renal Disease

Slot:

J 08: Saturday, 29 July 2017: 1:30 PM-2:45 PM

Scheduled Time:

1:30 PM

Keywords:

end-stage renal disease, patient outcomes and sodium

References:

¹ Thomas, MC, Moran, J, Forsblom, C, et al. The association between dietary sodium intake, ESRD, and all-cause mortality in patients with type 1 diabetes. *Diabetes Care*. 2011; 34(4): 861-866.

² Clark-Cutaia, M., Sommers, MS., Anderson, E., & Townsend, R. Design of a randomized controlled clinical trial assessing dietary sodium restriction and hemodialysis-related symptom profiles. *Contemporary Clinical Trials Communications*. 2016; 3: 70-73. doi:10.1016/j.conctc.2-16.04.002.

³ Brook, RD, Appel, LJ, Rubenfire, M, et al. Beyond medications and diet: alternative approaches to lowering blood pressure: a scientific statement from the American Heart Association. *Hypertension*. 2013; published online before print April 22, 2013, 10.1161/HYP.0b013e318293645f.

⁴ Clark-Cutaia, M, Ren, D, Hoffman, L, Burke, LE, Sevick, MA. Adherence to hemodialysis dietary recommendations: influence of patient characteristics, self-efficacy and perceived barriers. *Journal of Renal Nutrition*. 2014; 24(10): 92-99. DOI: 10.1053/j.jrn.2013.11.007

⁵ Stiller, S, Bonnie-Schorn, E, Grassmann, A, Uhkenbusch-Koerwer, I & Mann, H. A critical review of sodium profiling for hemodialysis. *Seminars in Dialysis*. 2001; 14(5): 337-347.

⁶ Smyth, A, O'Donnell, MJ, Yusuf, S, Clase CM, Teo, KK, Canavan, M, Reddan DN, & Mann JF Sodium intake and renal outcomes: a systematic review. *Am J Hypertens*. 2014; 10: 1277-84. DOI: 10.1093/ajh/hpt294.

Abstract Summary:

Globally, two million patients are undergoing hemodialysis for end-stage renal disease. Hemodialysis patients have higher morbidity and mortality associated with adverse events and a complex treatment regimen. This symposium explores patient, provider, and system factors that can be leveraged to decrease adverse events, readmission, and improve symptom management and quality-of-life.

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
1. Develop a rudimentary understanding of the greatest risk to mortality faced by End-Stage Renal Disease patients.	1. Background and Significance of Topic a. An estimated 3.8 million patients are undergoing treatment for end-stage renal disease (ESRD) worldwide. b. Approximately 2 million are undergoing hemodialysis treatment. c. When compared to their counterparts, hemodialysis patients have a higher risk and rate of mortality and reduced life expectancy. d. The leading causes of death in this population are cardiovascular disease accounting for 41% of death, 9% infection, 23% from unknown causes and 27% from other causes. e. Lifestyle modification is known to mitigate these risks, but adherence to recommendations is poor (20–78%). f. Given growth in ESRD globally, low adherence to evidence-based practice, and high risk of morbidity and mortality, innovative research is needed to identify and understand the factors unique to the ESRD and hemodialysis experience 2. Purpose of Symposium a. Explore patient, provider, and system factors that can be leveraged to decrease adverse events, readmission, and improve symptom management and quality-of-life. b. Dialogue between panel and audience regarding challenges in nursing care and nurse-led innovations for improving care of ESRD and hemodialysis patients
2. Identify current recommendations and restrictions in existing end-stage renal disease treatment modalities.	1. Background and Significance a. The intermittent nature of fluid elimination in HD places patients at a higher risk for increased interdialytic weight gain (IDWG), hypervolemia, azotemia, and electrolyte imbalance between treatment b. Studies have shown that large fluctuations in IDWG not only result in extracellular volume expansion and elevated blood pressure, but also increase the strain placed on the cardiovascular system c. IDWG is the product of water accumulation in the body from metabolism, dietary sodium,

	<p>and fluid intake d. Little is known about the appropriate sodium restriction to promote health in ESRD even though sodium restriction is a universal recommendation for ESRD management</p>
<p>3. Discuss new directions for nursing care of patients with end-stage renal disease.</p>	<p>2. Purpose of the Study and Conceptual Framework a. Given that sodium restriction is universally recommended for ESRD patients, innovative research is needed to understand the links between sodium restriction, symptom prevalence, symptom management, and ESRD b. A physiological conceptual framework based on the pathophysiology of ESRD and its symptoms guided the study development and methodology 3. Study Aims a. Aim 1: Demonstrate that symptom profiles and interdialytic weight gain (IDWG) vary among three sodium intake groups (CG, sodium intake of 1.5G, sodium intake of 2.4G), controlling for age, race, gender, and duration of disease b. Aim 2: Demonstrate that the effect of HD-specific variables [ultrafiltration rate (liters/hour) and total fluid removed (liters)] on the symptom profiles vary among the three sodium intake groups (CG, 1.5G, 2.4G), controlling for age, race, gender, and duration of disease c. Aim 3: Determine whether total body water (TBW), extracellular fluid (ECF), and intracellular fluid (ICF) measured with bioimpedance spectroscopy (BIS) vary across sodium intake groups (CG, 1.5G, 2.4G), controlling for age, race, gender, and duration of disease 4. Design a. We conducted a three-group, double blinded, randomized controlled trial with a sample of 42 HD patients with ESRD b. We assessed the effects of three levels of sodium intake (ambient [CG], 1.5G, 2.4G) on the HD participant symptom profile 5. Setting and Sample a. Patients were recruited from an urban, academic, tertiary acute care center. b. 42 participants, withdrawals due to illness, total of 40 participants 6. Results a. Overwhelmingly African American (85 %) b. 45 % reported hypertension as the etiology of</p>

	<p>ESRD c. Predominately male (52.5%) d. Mean age was 56 years (SD=11.69) e. The majority of participants perceived their health to be at least “good” (55%) f. Baseline quality of life scores were the same across the sample. g. No statistically significant difference in symptom scores, though participants reported clinical improvement in symptoms 7.</p> <p>Conclusion a. The findings from this study provides the first data from a randomized controlled trial on the effectiveness of reduced dietary sodium intake in hemodialysis patients to inform evidenced based practice, patient education, and nursing care quality b. A larger scale RCT is necessary to further explore the results of this study</p>
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Abstract Text:

Purpose: The purpose of this presentation is to explore the effect of dietary sodium restriction on patient quality of life and hemodialysis related symptom profiles. Dietary sodium intake independently increases the risk of mortality in end stage renal disease (ESRD)^{1,2}. It plays a significant role in hypertension, hypervolemia, and left ventricular hypertrophy (LVH), and blunts the effectiveness of hypertensive agents³. In addition, the hypervolemia associated with excessive dietary sodium intake results in the need for more intense fluid removal during hemodialysis (ultrafiltration), resulting in symptoms such as pain, cramps, hypotension, nausea, and vomiting during hemodialysis (HD) treatment sessions^{4,5}. Although sodium restriction is a universal recommendation for ESRD management, the National Kidney Foundation (NKF) recommendation of 2400 mg per day is consensus-based per the Dietary Approaches to Stop Hypertension (DASH) studies, not an evidence-based recommendation from data derived from a hemodialysis population. In addition, The Dietary Guidelines for Americans 2010 and American Heart Association (AHA), recommend further restriction of dietary sodium intake to 1500 mg per day for persons with hypertension and/or kidney disease, middle-aged and older adults, and African Americans, though there is also little empiric evidence to support this recommendation in the general population and none in the hemodialysis population⁶. Therefore, it remains to be demonstrated that a diet with such sodium restrictions is attainable, sustainable, safe or beneficial.

Methods: We conducted a double-blinded randomized controlled trial of 42 ESRD patients undergoing hemodialysis therapy. Patients were randomized into one of three dietary sodium intake groups. Primary outcomes were quality of life and symptom scores as operationalized by the Kidney Quality of Life and Palliative Outcome Scale-Renal Assessments.

Results: There was no statistically significant difference in symptom scores, though participants reported clinical improvement in symptoms.

Conclusion: The findings from this study provides the first data from a randomized controlled trial on the effectiveness of reduced dietary sodium intake in hemodialysis patients to inform evidenced based practice, patient education, and nursing care quality.