ORIGINAL RESEARCH

Is Nutrition Specific Quality of Life Associated With Nutritional Status?

Sarah Feasel-Aklilu, DCN, MEd, RD, CNSC, FAND, Andrea Marcus, PhD, MPH,† J. Scott Parrott, PhD,‡'§ Emily Peters, MPH,† and Laura Byham-Gray, PhD, RDN, FNKF†*

Objective: The study purpose was to explore the relationship between nutritional status, as measured by Subjective Global Assessment (SGA), and Health Related Quality of Life measured using the Nutrition Specific Quality of Life (NS-QoL), tool among participants on maintenance hemodialysis (MHD). The study aim was to determine if NS-QoL may be an adjuvant tool for detecting changes in nutritional status among patients on MHD.

Design, Setting, and Subjects: This is a cross-sectional, secondary analysis of data from a multi-center study. Participants were adult (>18) men and women on MHD (n = 145) recruited from 3 institutions in the Northeastern United States.

Methods: Statistical tests were conducted to determine the relationship between key demographic characteristics (age, sex, dialysis vintage, gender, and ethnicity) and SGA and NS-QoL. Spearman's correlation examined the relationship between the independent variable, SGA and the dependent variable, NS-QoL. A univariate general linear model was conducted to adjust for confounding variables.

Main Outcome Measure: The relationship between overall SGA score and composite NS-QoL score.

Results: The sample consisted of 85 men (58.6%), with a mean age of 55.3 ± 11.9 years, who were largely African–American (84.1%) and non-Hispanic (77.2%). Mean SGA score was 5.5 ± 1.0, and the mean NS-QoL composite score was 9.51 ± 3.77. No key demographic characteristics had a statistically significant relationship with SGA, whereas sex ($P < .001$) and race ($P = .015$) both had statistically significant relationships with NSQoL. After adjusting for the variables of race and sex, NS-QoL score was positively correlated with SGA composite score ($P = .042$); as NS-QoL score increased so did the SGA score.

Conclusion: The present study found a positive linear correlation between NS-QoL composite score and SGA, as well as 5 SGA subcomponent scores and NS-QoL. These findings indicate that NS-QoL can complement the SGA to provide information about a patient's nutritional status.

Introduction

CARE FOR INDIVIDUALS diagnosed with Stage 5 chronic kidney disease (CKD) on dialysis has progressed over the last 30 years leading to improved survival rates.[1,2] Despite improvements, morbidity and mortality of individuals on maintenance hemodialysis (MHD) is among the highest of all chronic conditions.[2-4] Between 2000 and 2008, the 5-year survival rate for patients on MHD in the United States was only 40%.[5] One contributor toward the high mortality rates is the prevalence of poor nutritional status among individuals on MHD.[6,7]

Malnutrition is a common occurrence among dialysis patients and is an independent risk factor of morbidity and mortality.[6,8-14] Nutritional status is one component of the larger syndrome of protein-energy wasting (PEW) that is known to affect between 17% and 75% of patients on MHD.[9,15-18] PEW includes the build-up of uremic toxins, aging, decreased nutrient intake, inflammation, hormonal dysfunction, specific metabolic derangements, comorbid conditions, catabolism associated with dialysis, infection, cardiovascular disease, nutrient losses from dialysis, frailty, and depression.[17,19] The current standard of practice for nutrition assessment among dialysis patients is the 7-point Subjective Global Assessment (SGA).[20-23] This tool explicitly assesses nutritional status, not PEW. Studies show that individuals on MHD with lower SGA scores and poor quality of life (QoL) have an increased risk of mortality.[6,10,24-28]

QoL is a broad construct taking into account all aspects of life, whereas health-related quality of life (HRQoL) encompasses physical, psychological, and social domains of health.[29,30] Low SGA scores have been linked to poor HRQoL.[31-33] Both HRQoL and nutritional status are predictors of mortality among patients on MHD.[15,34-37] Individuals on MHD do have a lower HRQoL when compared with a general population of adults.[33,38-41]

*Rutgers, The State University of New Jersey, Newark, NJ.
†Department of Nutritional Sciences at Rutgers, The State University of New Jersey, Newark, NJ.
‡Department of Nutrition, Rutgers University, School of Health Professions, Newark, NJ.
§Department of Interdisciplinary Studies, Rutgers University, School of Health Professions, Newark, NJ.

Financial disclosure: The authors declare that they have no relevant financial interests.

Address correspondence to Sarah Feasel-Aklilu, DCN, MEd, RD, CNSC, FAND, 7445 Farmington Close, New Albany, OH 43054. E-mail: feaselse@shp.rutgers.edu

1051-2276/$36.00
https://doi.org/10.1053/j.jrn.2017.12.011

Studies show that nutritional status and HRQoL are correlated and influenced by similar factors, such as appetite.[14,42]

Dwyer[43] and Burrowes[44] established the role of appetite as a component of nutrition-related quality of life and patient outcomes among adults on MHD. Using the Appetite and Diet Assessment Tool (ADAT), Dwyer et al. found that increased appetite was an independent factor contributing to higher mental and physical component scores on the Medical Outcomes Study Short-Form-36 (SF-36).[43] Following this work in the 2005 HEMO study, Burrowes et al. assessed the relationship between appetite, hospitalization, and death and reported a significant association between lower self-reported appetite and death.[44] These studies led to the development and testing of the Nutrition-Specific Quality of Life (NS-QoL) Questionnaire by Han et al. in 2012. The NS-QoL tool measures themes related to nutritional QoL for individuals on dialysis, such as appetite and food enjoyment.[45] General HRQoL questionnaires do not measure food intake and nutrition, instead they measure mental and physical health constructs. To measure the construct validity of the NS-QoL tool, it was compared to the traditional SF-36 among adults on MHD; a correlation between the two tools was found.[45] Considering nutritional status and QoL, both have a significant impact on mortality, it is imperative to understand their relationship with each other. The NS-QoL is a tool that links nutritional factors and HRQoL measures. Earlier studies of the NS-QoL did not test for a correlation between the total score and SGA.

To date, it is not known how NS-QoL or components of the NS-QoL, such as appetite or food enjoyment are associated with nutritional status when measured by SGA. In previous research exploring the relationship between HRQoL and SGA score, SGA was identified as a significant predictor of QoL in the physical health component among MHD patients.[31] This study provides insight to the NS-QoL and its relationship with SGA score. The NS-QoL had a significant positive association with SGA, indicating a relationship with nutritional status.

Methods

Design and Sample

This study is a cross-sectional secondary analysis of data from a 3-year, multi-center, federally funded study that developed and validated a predictive energy equation in adult hemodialysis patients.[46] The original study protocol is described in detail elsewhere.[46,47] Inclusion criteria for participants in the original study included adults aged ≥18 years ; diagnosed with Stage 5 CKD initiated on MHD 3 times weekly for at least 3 months; and have the ability to answer study-related questionnaires appropriately.[48] Individuals were excluded if they had a recent hospitalization within the last 30 days prior to enrollment; active infection or nonhealing wounds; undergone a surgical/elective procedure 30 days prior to enrollment; any cardiac-related events in less than 30 days prior to enrollment; currently not treated with conventional MHD three times weekly; pregnant; lactating; significant cognitive impairment or 3 months postpartum; self-reported use of dietary supplements or recreational drugs known to impact the metabolic rate.[47,48]

Institutional review board (IRB) approvals were obtained from each site (Case Western Reserve University 08-12-37, Pennsylvania State University–Hershey Medical Center 40781EP, and Rutgers University 2012001976), approval to conduct this secondary analysis was granted in 2016. Informed consent, which followed IRB requirements at each research site, was obtained from those willing to participate and meeting eligibility criteria.[47] A data release request was completed under the IRB continuing review. Data specific to the variables for this study (N = 145) were de-identified and provided to the principal investigator (S.F.A.) and included demographic characteristics, clinical measures, SGA, and NS-QoL.

Measurements

Subjective Global Assessment

The SGA was used to determine the nutritional status of each participant. The assessment is comprised of a brief physical examination and other information about the patient, including weight history, dietary intake, gastrointestinal symptoms, and functional capacity.[23] The composite SGA score is based on a combined score using a 7-point Likert scale for each of the SGA's 6 subcomponents. Subcomponents include the following domains: weight rating, intake rating, gastrointestinal rating, functional rating, disease rating, and examination rating.[23] Each subcomponent was scored between 1 and 7 and used to determine the total score. This 7-point scale was used to designate the nutrition status of the participant and shows an increase in the severity of malnutrition as the score decreases.[21] An overall score of 6 or 7 represents mild malnutrition risk to well nourished; scores of 3, 4, or 5 signify mild to-moderate malnutrition; and scores of 1 or 2 characterize severe malnutrition.[21]

In the original study, a 7-point SGA was conducted on a nonhemodialysis day.[47] Measurements were obtained in the initial research appointment by trained research personnel as a part of the original study following the protocol published by Steiber et al.[22] To substantiate inter-rater and intra-rater reliability, a 2-day training session was held among the 3 sites to demonstrate correct procedures in collecting measurements. Each study team member obtained a certification on the study procedures, a recertification was required on a yearly basis.

Nutrition Specific Quality of Life Questionnaire

The NS-QoL tool is a 15-item questionnaire that was developed by Han et al. to understand nutrition-related quality of life among individuals on MHD.[45] This tool