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Promoting Clinical Nutrition Science in Chronic Kidney Disease

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EDITORIAL

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AS WE BEGIN this new decade, the Editors, Editorial staff, and Editorial Board of the *Journal of Renal Nutrition* (*JREN*) are excited to bring our readers topics of interest and opportunities to learn the latest science in renal nutrition, dietetics, and metabolism. We will focus on these topics by including emphasis on physical function, strategies for prevention, and community-based nutrition efforts. We plan to bring topics such as methods of educating the patients and their physicians and dietitians on ways to incorporate healthiest diets across the stages of kidney disease. We solicit articles directed to better understanding the nutritional needs of kidney transplant recipients and the nutritional management of this therapy from the preemptive kidney transplant recipient through the life cycle of a kidney transplant. Another prime-time topic in 2020 and beyond is the prevention of kidney disease, consistent with the World Kidney Day's theme of the year, along with the emerging role of nutritional and dietary interventions to prevent *de novo* kidney disease, i.e., primary prevention, and to slow the progression of early chronic kidney disease (CKD) or its transition to end-stage renal disease, i.e., secondary and tertiary prevention, respectively. To that end, a low-protein diet with more plant-based sources of protein has already exhibited a strong comeback, while the kidney safety of high-protein diets appears to be seriously questioned. We are also interested to learn more about the nutritional management of patients on home dialysis and how nutrition care is delivered and assessed in this setting. In addition, we hope to expand our readership to a larger audience who seek knowledge for managing the nutrition care for patients with kidney disease across all stages of the condition and methods of therapy. The science presented in the *JREN* has an extensive scope and needs to be read by all healthcare practitioners who see patients with kidney disease. We are hopeful that you, as a current reader, will share the knowledge you gain by reading the *JREN* with your patients, peers, and colleagues in health care to contribute to improving the nutritional health of people with kidney disease.

In the first issue of 2020, the Journal provides readers with nutrition science in CKD stages 1-5 and including dialysis from around the world. To begin the issue, Biruete et al.[1] review the gastrointestinal effect of phosphate binders and the paucity of information regarding the effect of phosphate binders on gut microbiota, uremic toxins, and vitamin and nonphosphate mineral effects. They emphasize the importance of understanding the systemic effects of phosphate binders and implore investigators to increase the nutrition-related science around these issues.

Six original research articles in this issue pertain to nondialysis CKD patient care.[2-7] They range in topics from urinary biomarkers of dietary intake, bowel habits and uremic toxins, inflammatory cytokines and insulin resistance, low-protein diets and gene expression, to using smartphone apps to teach dietary concepts for early stages of CKD. In the first of the six articles, using a cohort of more than 5,000 patients in China with stages 1-4 CKD, Hu et al.[2] compared spot urine results to 24-hour urine sodium excretion to provide predictive equations for the more easily obtained spot urine. The 24-hour urine sodium was higher than the spot urine result, but the number of urine collections made it possible to model the equations with fairly high correlation coefficients. The investigators have coined their equation "CKDSALT." This effort may assist clinicians to more accurately assess urine sodium in patients with CKD than standard equations being used where kidney function was not considered. The approach needs further validation in multiple populations.

From another cohort study, Hu et al.[3] examined the alcohol use reported by more than 12,000 black and white participants of the Atherosclerosis Risk in Communities study in the United States as a potential risk factor for CKD. Almost 29% of the participants in the Atherosclerosis Risk in Communities study subsequently developed CKD during a median follow-up of 24 years. These investigators found an inverse association of alcohol use and development of CKD in adjusted analyses and concluded that modest alcohol consumption in CKD may be similar to the finding in coronary heart disease.

Ramos et al.[4] examined the association of constipation and the uremic toxins p-cresol sulfate and indoxyl sulfate in 50 patients in Brazil with nondialysis CKD stages 3-5. They used the Bristol stool scale and Rome III criteria to assess constipation and measured serum and urine concentration of the uremic toxins. They also assessed a 3-day diet record. The investigators found that constipation correlated with higher p-cresol sulfate independent of kidney function and dietary fiber but did not correlate with indoxyl sulfate. The study reiterates the importance of monitoring for bowel habits in patients with CKD.

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In another investigation from Brazil, Barreto Silva et al.[5] report a positive correlation between total body adiposity and the inflammatory cytokine tumor necrosis factor-alpha in more than 200 patients with CKD stages 3-5. They also demonstrated a positive correlation between the anthropometric waist-to-hip ratio and the inflammatory cytokines tumor necrosis factor-alpha, interleukin-8, and monocyte chemoattractant protein-1. Furthermore, after excluding patients with diabetes, a positive correlation was demonstrated between these cytokines and the estimate of insulin resistance known as the Homeostatic Model Assessment of Insulin Resistance. This elegant study endorses the need for renal nutrition practitioners to address body adiposity in patients with kidney disease.

Nuclear factor erythroid 2–related factor 2 (Nrf2) is known to be a regulator of cellular resistance to oxidative stress. dos Anjos et al.[6] evaluated the ability of a low-protein diet (0.6 g of protein/kg/day, 50-60% high biological quality) provided to 30 patients in Brazil with CKD stage 3-4 and evaluated the Nrf2 gene expression modulation associated with the dietary approach. After 6 months on the low-protein diet, Nrf2 gene expression increased significantly and markers of oxidation were reduced, thus making another case for low-protein diets in CKD.

A challenge of caring for patients with early stages of CKD is outreach and access to nutrition counseling. Chang et al.[7] focused on dietary sodium, fruit and vegetable intake, and behavior change in a feasibility study evaluating patients in the US with stages 1-3a CKD using a smartphone application (app). The investigators report on the process of selecting the app and some of the hurdles they encountered. This is important information in the new field of (1) outreach to patients with early CKD for nutrition care and (2) novel approaches to nutrition counseling. Studies such as the one conducted by Chang et al.[7] will advance our ability to attend to the nutritional needs of people with early CKD.

Moving to dialysis research, the Journal publishes three original research reports coming from France, the US, and Mexico in this issue.[8-10] Deleaval et al.[8] report on the mass balance of branched-chain amino acids (BCAAs) in a randomized, crossover study of patients on hemodialysis in France. Six patients were randomized to receive BCAAs (valine, isoleucine, and leucine) additive in their dialysate or no BCAA additive during a single midweek dialysis treatment followed by the crossover the following midweek dialysis treatment. Patients were told to refrain from eating for 12 hours before their treatment. During the BCCA additive treatment, a significant increase in plasma for each of the BCAAs was observed, while a significant decrease in valine was observed in the no BCCA additive treatment. The investigators provide an interesting and useful approach to quantify the mass balance of these BCAAs during hemodialysis and make a case for future studies to evaluate the utility of a BCAA additive in the dialysate to prevent alterations in these important amino acids.

Wong et al.[9] report on the use of nutrition risk indicators to predict mortality in more than 21,000 patients on hemodialysis in the US who had been treated with hemodialysis for at least 1 year. They compared the change in nutritional parameters that occurred over a 6-month period with the risk of morbidity (assessed as hospitalization) and mortality in a large US dialysis cohort. They produced prediction models in a test sample of the cohort and then validated the models in the validation cohort. The investigators suggest that the models, which use readily available parameters, more accurately predict 1-year mortality and hospitalization than is currently available. The models could also assist in determining who may benefit the most from nutrition intervention. The approach requires further validation in a prospective cohort but offers promise of improved assessment techniques using available data variables.

Marquez-Herrera et al.[10] provide a peek into taste perceptions of patients on dialysis in Mexico. They developed a taste perception test evaluating the perception of sweet, sour, salty, bitter, and umami tastes which they validated in 112 healthy volunteers and tested in 75 patients on dialysis (58% hemodialysis and 42% peritoneal dialysis) that uses a single tester instead of the more common multiple testers. They further subdivided the patients on dialysis into malnourished and well nourished to test for taste differences. A greater proportion of patients on dialysis misidentify tastes than healthy volunteers, especially sweet and umami tastes. Furthermore, patients on dialysis have a lower intensity of sour taste than healthy volunteers. The editors postulate that further research into taste alterations should examine whether counteractions to these alterations might be deployed to improve dietary intake in patients with kidney disease. Further studies such as this one may also be beneficial to perform at earlier stages of CKD.

Our patient education piece in this issue is a guide for patients with CKD with regard to eating out.[11] The handout can be used to provide patients with practical guides to determining portion sizes and assessing menus in advance of visiting the restaurant. As always, the handout is accompanied by a guide for the clinician to use in teaching patients. The patient education piece is available online only at: (https://doi.org/10.1053/j.jrn.2019.08.005).

It is our hope that these articles will inspire you as you care for patients with kidney disease and provide you with deeper insight into their needs as we strive together to make their lives better.

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