WCN abstract

Category: chronic kidney disease, hypertension, diabetes and CVD

Topic
Epidemiology, outcomes and health service research related to CKD or its complications

Presentation preference
Oral OR Poster Presentation

Abstract title
NUTRITIONAL STATUS AND ORAL NUTRITIONAL SUPPLEMENT USE AMONG PATIENTS WITH NON-DIALYSIS CHRONIC KIDNEY DISEASE IN BRITISH COLUMBIA, CANADA

Keywords
nutrition
chronic kidney disease
oral nutritional supplement
malnutrition

Introduction
Undernutrition and protein-energy wasting (PEW) are complications of advanced chronic kidney disease (CKD) that are associated with increased risk of mortality and morbidity. In British Columbia, a Nutritional Supplement Policy is stewarded by renal dietitians and guides prescription of oral nutritional supplementation (ONS) for CKD patients of all eGFR levels who have unintentional weight loss >10% in past 6 months, current weight of <90% of desirable body weight, inadequate nutrient intake (<80% of recommended intake), or a hypercatabolic state.

Given the paucity of studies assessing ONS in non-dialysis CKD patients at risk for undernutrition and PEW, we aimed to characterize nutritional status and ONS treatment patterns in this population.

Methods
We conducted a retrospective study of non-dialysis CKD patients who entered and were followed at multidisciplinary CKD clinics in the province of British Columbia, Canada between January 2013 and December 2018. We used Wilcoxon signed-rank test to compare baseline nutrition and inflammation parameters within 6 months of entry to the CKD clinic among patients with at least one prescription of ONS within 1 year of entry and those not prescribed ONS. Using descriptive statistics, longitudinal ONS prescription patterns over 3 years were analyzed for CKD patients who entered CKD clinics during 2013-2015.

Results
15859 patients who entered the CKD clinic during 2013 to 2018 were included in the analysis of nutritional lab parameters. Of these, 1389 patients (9%) were eligible for and prescribed ONS. Patients taking ONS had lower eGFR, greater age, lower BMI, higher phosphate, lower bicarbonate, higher ferritin, higher PTH and lower hemoglobin and higher neutrophil-to-lymphocyte ratio compared to those who did not receive ONS (see Table). Differences in lab parameters between patients taking ONS and not taking ONS persisted when analyzed by age category and eGFR category. In the longitudinal analysis from 2013-2015 (N=7611), overall ONS use in the 1st, 2nd, and 3rd year of CKD clinic follow-up remained stable (8.3%, 8.0%, 8.9% of patients, respectively), with approximately 40% new ONS users and 60% previous ONS users during the 2nd and 3rd year of follow-up. Among patients who were prescribed ONS within the first year after entry to CKD clinic and who continued CKD follow-up in the subsequent year, 38% discontinued ONS use, 35% received 1-2 ONS prescriptions/year, and 27% received 3+ ONS prescriptions/year.

Table: Baseline characteristics within 6 months of CKD clinic entry, by oral nutritional supplement (ONS) use

	Patients receiving ONS N=1389	Patients not receiving ONS N=14470
Age (years)*	75.4 [64.6, 82.8]	71 [60.8, 79.2]
Female (%)	46%	44%
Comorbidities (%)		
Diabetes	50%	52%
Hypertension	77%	74%
eGFR (ml/min/1.73 m^2)*	24 [17, 32]	30 [23, 40]
<15 (%)	17%	7%
15-29 (%)	52%	41%
30-44 (%)	24%	33%
45-59 (%)	5%	10%
≥ 60 (%)	2%	9%
Urine ACR (mg/mmol)*	32.2 [5.1, 182.1]	16.4 [2.9, 102.4]
< 3 mg/mmol (%)	17%	25%
≥ 3 mg/mmol (%)	83%	75%
Body Mass Index (kg/m^2)*	24.6 [21.8, 28.0]	28.1 [24.5, 32.3]
< 18.5 (%)	6%	2%
18.5 - 24.9 (%)	50%	27%
25 - 29.9 (%)	28%	34%
≥ 30 (%)	16%	37%
Serum albumin (g/L)*	38 [34, 41]	40 [37, 43]
< 38 g/L (%)	45%	28%
≥ 38 g/L (%)	55%	72%
Serum total cholesterol (mmol/L)	4.1 [3.4, 5.2]	4.3 [3.5, 5.2]
< 2.59 mmol/L (%)	7%	4%
≥ 2.59 mmol/L (%)	93%	96%
Serum phosphate (mmol/L)*	1.3 [1.1, 1.5]	1.2 [1.1, 1.4]
< 0.75 mmol/L (%)	1%	1%
≥ 0.75 mmol/L (%)	99%	99%
Serum bicarbonate (mmol/L)*	24 [22, 27]	25 [23, 27]
< 22 mmol/L (%)	23%	15%
≥ 22 (mmol/L (%)	77%	85%
Serum ferritin (µg/L)*	141 [69, 315]	113 [56, 223]
<100 µg/L	38%	45%
100-499 µg/L	48%	48%
≥ 500 µg/L	14%	7%
Iron saturation	0.23 [0.16, 0.31]	0.23 [0.17, 0.31]
< 0.22	45%	43%
≥ 0.22	55%	57%
Hemoglobin (g/L)*	107 [95, 120]	118 [104, 132]
< 100 g/L	36%	18%
≥ 100 g/L	64%	82%
PTH (pmol/L)*	11.3 [6.8, 18.4]	9.2 [5.7, 15]
<18 pmol/L	74%	82%
≥18 pmol/L	26%	18%
Neutrophil-to-lymphocyte ratio*	3.3 [2.2, 5.1]	2.8 [2.0, 4.2]
<4	60%	72%
≥4	39%	28%

Values are represented as median (interquartile range) or prevalence (%) among patients with non-missing values

*p<0.0001 for Wilcoxon two-sample test comparing ONS and no ONS group

Conclusions

Among non-dialysis CKD patients in British Columbia, 9% of patients received ONS treatment, which in turn provides an estimate of the prevalence of undernutrition, as defined by dietitian assessment and corroborated by nutritional lab parameters. ONS prescription patterns demonstrate responsible prescribing and de-prescribing of ONS in a non-dialysis CKD population within a universal health care system. Future analyses will assess the effect of ONS on patient outcomes including progression to end-stage kidney disease and patient-reported symptom burden.

Declaration
Corporate sponsored research or other substantive relationships:
Michael Smith Foundation for Health Research