

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0086

Abstract Submission No. : APCN20250014

Risk Factors and Characteristics of Gastrointestinal Lesions in Chronic Kidney Disease Patients with Anemia Admitted in a Tertiary Hospital: A Single-Center Retrospective Study

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Abstract

Background: Chronic kidney disease (CKD) frequently presents with anemia as a complication, but the relationship between CKD-associated anemia and gastrointestinal (GI) lesions remains incompletely understood. This study aimed to determine the risk factors and characteristics of GI lesions in CKD patients with anemia in a tertiary hospital setting.

Methods: A retrospective study was conducted and included 568 admitted adult patients with CKD stage IIIa or higher and anemia who underwent endoscopy and/or colonoscopy between September 2017 and January 2024. Patient demographics, clinical characteristics, and endoscopic findings were analyzed using descriptive statistics and multivariable logistic regression.

Results: GI lesions were found in 89.96% (CI: 87.19-92.31) of the study population, with upper and lower GI tract involvement in 77.46% and 83.80% of patients, respectively. The most common lesions were gastritis (62.50%) and hemorrhoids (58.63%). Two multivariable models were done. In the primary model, significant risk factors for GI lesions included chronic glomerulonephritis (CI: 7.95-214.47), hypertensive nephropathy (CI: 4.53-114.37), and iron supplementation (CI: 8.04-328.64). A sensitivity analysis done confirmed these associations: chronic glomerulonephritis (CI: 3.65-31.20) and hypertensive nephropathy (CI: 4.18-47.43). Both models consistently identified protective associations with lower hemoglobin levels (OR 0.04-0.08) and obesity (OR 0.05- 0.11).

Conclusions: This study shows that GI lesions are surprisingly common in CKD patients with anemia, much more common than was previously reported. These findings support the implementation of systematic GI screening protocols for CKD patients, particularly those with identified risk factors, and highlight the need for carefully tailored therapeutic approaches in managing anemia in this population.

Keywords : Anemia; Chronic Kidney Disease; Gastrointestinal Lesion; Endoscopy; Colonoscopy

	Univariable			Multivariable - Model 1			Multivariable - Model 2		
	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value
Age, y	0.83	0.79, 0.88	<0.001				0.93	0.87, 1.00	0.039
Employed	33.6	8.11, 139.22	<0.001	19.14	0.90, 406.68	0.058			
Smoker	0.19	0.10, 0.35	<0.001						
Alcoholism	0.63	0.36, 1.11	0.109	3.37	1.23, 9.26	0.019			
Obesity (BMI >30 kg/m ²)	0.14	0.08, 0.25	<0.001	0.05	0.01, 0.22	<0.001	0.11	0.04, 0.31	<0.001
Essential Hypertension	7.99	4.48, 14.28	<0.001						
Type 2 Diabetes Mellitus	73.48	10.09, 534.96	<0.001						
On HD	19.9	2.73, 145.20	0.003	26.73	0.98, 725.87	0.051			
Diabetic nephropathy	22.52	6.95, 72.97	<0.001						
Hypertensive nephropathy	15.07	7.55, 30.06	<0.001	22.75	4.53, 114.37	<0.001	14.08	4.18, 47.43	<0.001
Chronic glomerulonephritis	0.32	0.17, 0.59	<0.001	41.29	7.95, 214.47	<0.001	10.67	3.65, 31.20	<0.001
Polycystic Kidney Disease	0.16	0.08, 0.34	<0.001						
Urate Nephropathy	0.29	0.12, 0.72	0.008	0.04	<0.01, 0.41	0.007			
Lupus Nephritis	0.33	0.13, 0.86	0.023	7.88	1.08, 57.33	0.041			
IgA Nephropathy	1.93	0.25, 14.76	0.528						
Oral anticoagulants	0.74	0.39, 1.40	0.354	0.03	<0.01, 0.17	<0.001	0.06	0.02, 0.23	<0.001
Steroids	0.56	0.30, 1.05	0.069						
Iron	31.78	12.42, 81.31	<0.001	51.4	8.04, 328.64	<0.001			
ESA	19.39	5.99, 62.82	<0.001						
Hemoglobin, g/dl	0.11	0.06, 0.20	<0.001	0.04	0.01, 0.15	<0.001	0.08	0.03, 0.20	<0.001
Transferrin saturation index, %	0.74	0.69, 0.80	<0.001						

Model 1 - all variables of interest were entered in the multivariable regression followed by variable selection by backward elimination.

Model 2 - variables of interest with at least 10 with GI lesion/s and at least 10 without GI lesion/s were entered in the multivariable regression followed by variable selection by backward elimination.

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0087

Abstract Submission No. : APCN20250046

Effects of Egg Protein Supplementation on Albumin Levels in Dialysis Patients

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Abstract

Background: Thailand is experiencing a growing number of patients with chronic kidney disease (CKD), many of whom suffer from malnutrition due to inadequate and poor-quality food intake. Eggs are a highly nutritious source of protein and may help improve nutritional status and increase serum albumin levels, which are associated with reduced mortality. In response, the dialysis unit at Photharam Hospital initiated an egg donation project to support hemodialysis patients with nutritional deficiencies. This study aimed to evaluate the effectiveness of egg consumption in this patient population.

Objective: To assess the effects of egg protein supplementation on changes in serum albumin and other biochemical parameters in hemodialysis patients.

Methods: A study was conducted using data from hemodialysis patients who received egg supplementation between June 2022 and June 2023. Laboratory data were collected at baseline, 6 months, and 12 months. Changes in albumin and other biochemical markers were analyzed over time.

Results: A total of 48 patients were included, with a mean age of 51.1 ± 14.8 years and a dialysis duration of 43.6 ± 26.8 months. The mean body mass index (BMI) was 23.7 ± 6.0 kg/m². Serum albumin levels increased from 3.66 ± 0.42 g/dL at baseline to 3.96 ± 0.34 g/dL at 6 months and 3.85 ± 0.36 g/dL at 12 months. Post hoc analysis showed a statistically significant increase of 0.3 g/dL at 6 months ($p < 0.001$) and 0.19 g/dL at 12 months ($p = 0.03$). No significant changes were observed in hemoglobin, calcium, phosphorus, parathyroid hormone, cholesterol, or triglyceride levels throughout the study period.

Conclusion: Egg supplementation in hemodialysis patients significantly increased serum albumin levels, particularly within the first 6 months, and maintained improved levels up to 12 months. No adverse changes were observed in other biochemical parameters. Therefore, egg protein supplementation may be a safe, effective, and low-cost intervention to improve the nutritional status of this patient group.

Keywords : Egg, Albumin, Hemodialysis

Table 1 basic characteristics of patients

Characteristics

male	20
female	28
Age(year)	51.1±14.8
Underlying disease	
diabetes	19 (39.6%)
hypertension	45(93.8%)
cardiovascular disease	6(12.5%)
cerebrovascular disease	3(6.3%)
Duration of dialysis(month)	43.6±26.8
Height(cm.)	160.7±8.8
Weight(kg.)	61.2±16.4
BMI (kg/m2)	23.7±6.0

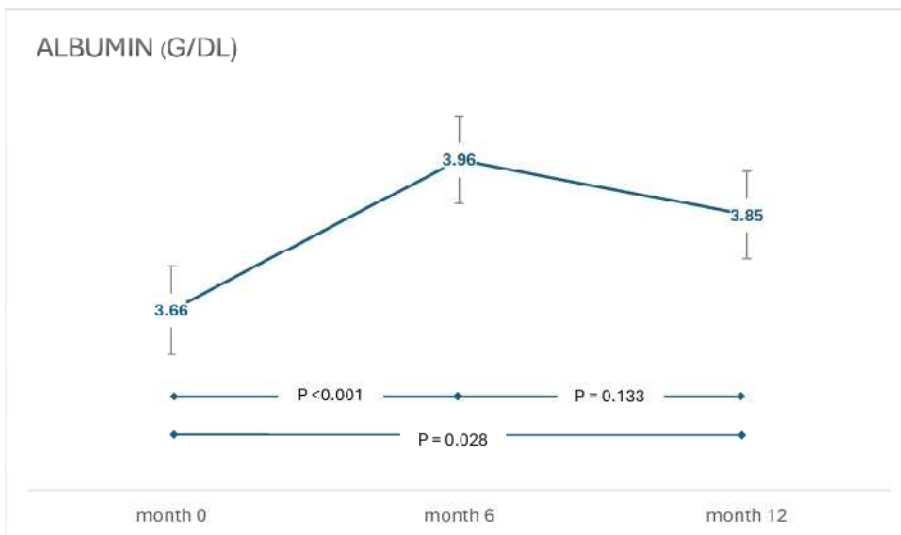


Table 2 Average biochemical parameter according to the duration of study

	Month 0	Month 6	Month 12	P-value
Albumin(mg/dl)	3.66 ± 0.42	3.96 ± 0.34	3.85 ± 0.36	<0.001
Hemoglobin(g/dl)	10.08 ± 2.88	10.09 ± 3.06	10.27 ± 2.61	0.64
Phosphorus(mg/dl)	5.39 ± 2.11	5.45 ± 2.04	5.04 ± 1.95	0.31
Calcium(mg/dl)	8.56 ± 0.92	8.44 ± 1.00	8.63 ± 0.79	0.13
PTH(pg/dl)	705.89 ± 548.78	863.14 ± 709.16	772.71 ± 655.47	0.10
Cholesterol(mg/dl)	173.10 ± 37.95	168.21 ± 38.37	N/A	0.29*
Triglyceride(mg/dl)	123.12 ± 65.49	119.83 ± 57.74	N/A	0.70*

* Paired T-test

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0088

Abstract Submission No. : APCN20250053

YKL-40 as a Biomarker of Inflammation-Associated Malnutrition in Hemodialysis Patients: Predictive Value for Low Lean Tissue Index

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Abstract

Background:

Malnutrition, particularly loss of lean body mass, is highly prevalent in hemodialysis (HD) patients and is linked to poor clinical outcomes. Lean Tissue Index (LTI), derived from bioimpedance analysis, serves as a key indicator of somatic protein stores and is a validated marker of protein-energy wasting. This study evaluated YKL-40, an inflammatory glycoprotein, for its diagnostic and predictive value in identifying patients with low LTI, reflecting malnutrition and muscle wasting.

Methods:

We analyzed 226 HD patients using body composition monitoring and laboratory biomarkers including YKL-40, IL-6, Albumin, hsCRP, and Creatinine. Multivariate regression and logistic modeling were employed to identify independent predictors of low LTI. Receiver operating characteristic (ROC) curves and calibration plots assessed model performance.

Results:

YKL-40 levels were significantly elevated and inversely associated with LTI, BCM, and Creatinine. In multivariate models, IL-6 and dialysis vintage were independent predictors of YKL-40 levels. YKL-40 alone predicted low LTI with an AUC of 0.70. The addition of Albumin and hsCRP significantly improved model performance (AUC = 0.77; $p < 0.000001$), highlighting their additive predictive value.

Conclusion:

YKL-40 is a promising biomarker for identifying inflammation-associated malnutrition in HD patients. Its predictive power for low LTI is enhanced when combined with Albumin and hsCRP, supporting the utility of a multi-biomarker approach for early nutritional risk screening and intervention in dialysis care.

Keywords : YKL-40; Hemodialysis; Lean Tissue Index (LTI); Malnutrition

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0089

Abstract Submission No. : APCN20250104

High ambient PM10 exposure is associated with a high prevalence of metabolic dysfunction-associated steatotic liver disease

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Abstract

Background: Metabolic dysfunction-associated steatotic liver disease (MASLD) is the most common liver disease globally, affecting around 25% of the population. It is linked to obesity, insulin resistance and other cardiometabolic risk factors. Recently, the link between air pollution and metabolic diseases has been much more prominent. This study analyzed data from over 1800 individuals in southern Taiwan, integrated with air pollutant concentration levels, utilizing a fine spatial-temporal resolution ensemble mixed spatial model, enhanced by geospatial artificial intelligence technology. The aim of this approach was to investigate the potential association between exposure to air pollutants and MASLD.

Methods: We enrolled participants who completed a health survey in southern Taiwan, and linked these data with air pollutants data obtained from the Central Weather Bureau, and then processed the data using a machine learning model. The diagnosis of MASLD was confirmed by the presence of hepatic steatosis and the exclusion of significant alcohol consumption and viral hepatitis. The following diagnostic criteria were applied: (1) body mass index ≥ 25 kg/m² or waist circumference ≥ 94 cm for males and ≥ 80 cm for females. (2) fasting plasma glucose levels ≥ 100 mg/dL, glycated hemoglobin A1c levels $\geq 5.7\%$, a prior diagnosis of diabetes, or ongoing diabetes treatment. (3) blood pressure $\geq 130/85$ mmHg or current antihypertensive treatment. (4) triglyceride levels ≥ 150 mg/dL or current lipid-lowering therapy. (5) low levels of high-density lipoprotein cholesterol (< 40 mg/dL for males and < 50 mg/dL for females) or lipid-lowering therapy.

Results: The mean age of the 1803 enrolled participants was 57.3 ± 11.4 years. The prevalence rate of MASLD was 41.9%. After multivariable regression analysis, the average of PM10 value (per 1 $\mu\text{g}/\text{m}^3$; odds ratio = 1.037; 95% confidence interval = 1.003-1.072; $p = 0.031$) was positive significantly associated with MASLD. Other air pollutants, including PM2.5, CO, NO₂, NO_x, SO₂, and O₃ were not significantly associated with MASLD.

Conclusion: High PM10 is found to associate with a high prevalence of MASLD. The findings of this study have important implications for public health and environmental policy. Specifically, the results of this study may be useful in individuals and organizations to take action to reduce air pollution and promote public health.

Keywords : air pollution, particulate matter with a diameter $10 \mu\text{m}$ (PM10), metabolic dysfunction-associated steatotic liver disease

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0091

Abstract Submission No. : APCN20250158

Tenapanor for Gastrointestinal Complications

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Abstract

Purpose: Tenapanor, due to the mechanism of action, water transfer into the intestinal tract causes diarrhea and significantly reduces medication adherence. Therefore, we analyzed the relationship between adherence and treatment effect by taking measures against gastrointestinal complications from the time of administration of tenapanor to hemodialysis patients with hyperphosphatemia.

Subjects and Methods: A total of 31 patients, 26 men and 5 women, who were currently taking PB orally, were given 10 mg/day of tenapanor after 4 weeks of add-ons compared with before tenapanol administration. In addition, as a countermeasure against gastrointestinal complications, bowel control drugs were administered in all cases, and all eight cases of laxative use were discontinued.

Results: All statistics are given as medians. The age was 54.9 years (35~70 years), the primary disease was nephrosclerosis (9 patients), diabetic nephropathy (8 cases), chronic glomerulonephritis (8 cases), polycystic kidney disease (4 cases), and other 2 patients with dialysis history of 9.9 years (0.2~27.9 years), and the breakdown of PB was 21 lanthanum carbonate, 10 precipitated calcium carbonate, 8 iron-containing systems, and 4 polymers.

"Pre-dose", Pi (mg/dL), cCa (mg/dL), intactPTH (pg/mL), and Bristol Scale (BS) at 4 weeks after administration were each "7.4(4.8~12.4)", 6.9(4.5~11.0), "8.9(7.4~10.3)", 8.8(7.4~10.7), "129.8 (26.4 ~ 436.7)", 178.6 (7.4 ~ 395.2), "4.0 (0 ~ 5)", and 4.0 (4 ~ 7).

In addition, the median daily dose remained unchanged over time, but after 1 week, 3 patients stopped taking the drug and 1 patient lost weight in 4 patients with a BS score of 7 points, and after 4 weeks, all 3 patients with a BS score of 3 points reduced the dose.

Conclusion: The key to continuing Tenapanor, a new phosphorus-lowering drug, is how to deal with the side effects of diarrhea. It is recommended that the drug be fully taken before administration, that the drug can be discontinued according to the degree of diarrhea during administration, and that the dose should be reduced and resumed when the diarrhea is resolved.

Keywords : tenapanor, hyperphosphatemia, diarrhea

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0092

Abstract Submission No. : APCN20250197

Effect of increased visceral fat on all-cause mortality in female patients enrolled in a Fracture Liaison Service program in central Taiwan

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Abstract

Background: According to European and Japanese guidelines, obesity is defined by a visceral fat area ≥ 100 cm² or an abnormally high body fat percentage. An elevated relative fat mass percentage has been shown to predict all-cause mortality in both men and women. This study aimed to investigate the association between visceral fat and body composition, as well as their impact on all-cause mortality in patients with fragility fractures.

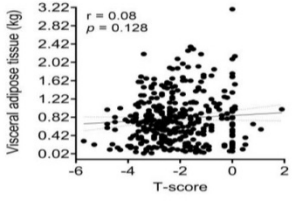
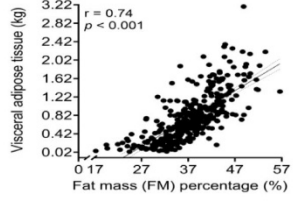
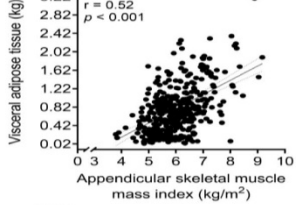
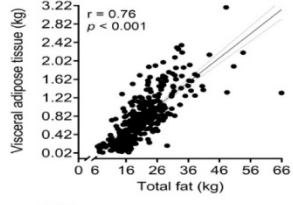
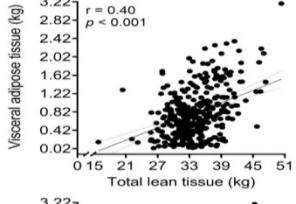
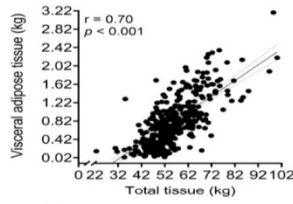
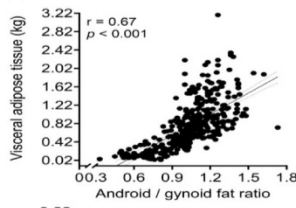
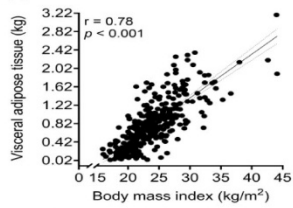
Materials and Methods: This retrospective cohort study included both inpatients and outpatients aged 18 years or older with a history of fragility fractures, drawn from a tertiary hospital-based Fracture Liaison Service program between 2018 and 2024. Visceral adipose tissue (VAT) was measured via imaging from the 10th rib to the iliac crest. Pearson correlation analysis was used to evaluate associations between VAT, anthropometric indices, and body composition parameters. Cox proportional hazards models and Kaplan–Meier survival curves were employed to assess the primary outcome of all-cause mortality.

Results: A total of 538 patients (mean age 67.9 ± 14.0 years; 72.7% female) were included. During a median follow-up period of 0.7 years (IQR: 0.2–1.4), 22 patients died. VAT was strongly correlated with body mass index (BMI), fat mass, and android/gynoid fat ratio in both sexes. In males, VAT showed weak associations with lean mass and no correlation with T-scores. In females, VAT demonstrated a moderate correlation with lean mass and a strong correlation with appendicular skeletal muscle index (ASMI), but no association with T-scores. A VAT cutoff value of >538 g was identified via ROC curve analysis as being significantly associated with increased mortality. After adjusting for age or comorbidities, higher VAT remained a significant predictor of increased all-cause mortality. Kaplan–Meier analysis revealed that female patients with VAT >538 g had significantly poorer survival compared to those with VAT ≤ 538 g.

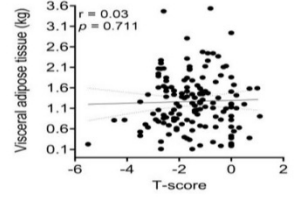
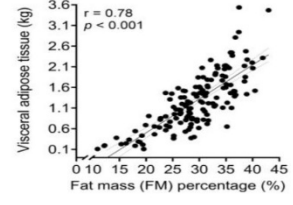
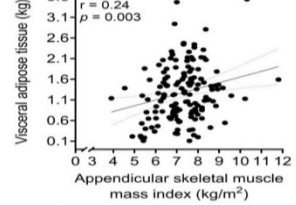
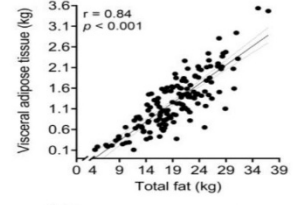
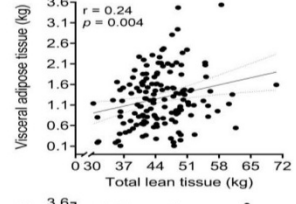
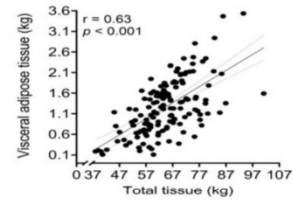
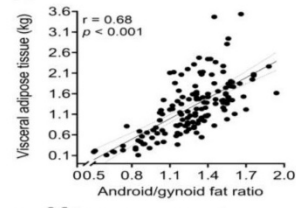
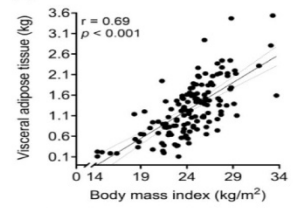
Conclusion: This study underscores the utility of VAT measurement as an alternative index for obesity assessment, its relationship with body composition, and its significant impact on all-cause mortality in female patients with fragility fractures.

Keywords : Visceral adipose tissue, body composition, appendicular skeletal muscle index, all-cause mortality

(a) Female



(b) Male



Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0093

Abstract Submission No. : APCN20250225

Association of Serum Magnesium Levels and Calcimimetic Use for Cardiovascular Events in Dialysis Patients

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Abstract

Background

Lower serum Mg levels are associated with all-cause death and cardiovascular events (CVEs) in hemodialysis patients. Calcimimetics use is likely to reduce CVE risk. Serum Mg concentrations are suggested to affect calcimimetics' responsiveness. However, the interaction of calcimimetics and Mg on CVEs remains unclear.

Methods

We conducted a retrospective analysis on 403 HD patients (female, 36.7%; age (median), 62; HD vintage (median), 76 months) in a single facility in Japan. The patients were divided into the user (U; n=196) and the non-user groups (N; n=207), based on the status of calcimimetics use at baseline. CVEs included cardiovascular death, nonfatal myocardial infarction or stroke, unstable angina, transient ischemic attack, or hospitalization for heart failure or ventricular arrhythmia. Multivariable Cox regression analysis and Kaplan-Meier analysis were applied for the analytical approach.

Results

Median observation period was 64 months. CVEs significantly occurred in patients in the below-median Mg levels than in those in the above-median Mg levels (Hazard ratio (HR), 0.34 [95% confidence interval, 0.13-0.80]; P = 0.018) among the N group, but the incidence of CVEs was comparable among the U group (HR, 1.48 [0.60-3.68]; P = 0.397). A similar trend was observed in all-cause mortality.

Conclusion

These results suggest that low Mg levels may be a predictor of CVEs in hemodialysis patients without calcimimetics, and the benefits of Mg against CVEs may be attenuated under the use of calcimimetics.

Keywords : Mg, calcimimetics, cardiovascular events

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0094

Abstract Submission No. : APCN20250232

Link Between Bone Mass and Anemia in Non-Dialysis Chronic Kidney Disease: Evidence from the KoreaN Cohort Study for Outcome in Patients With Chronic Kidney Disease

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Abstract

Introduction: Several studies have reported on the close associations between the anemia and an increased risk of bone loss. However, the effect of bone mineral density (BMD) on anemia has not yet been established in patients with chronic kidney disease (CKD) patients. Therefore, the aim of this study is to investigate the relationship between BMD and anemia in a non-dialysis CKD cohort.

Methods: Among 2,238 patients with non-dialysis CKD enrolled in the KoreaN cohort study for Outcome in patients With Chronic Kidney Disease (KNOW-CKD), 2,081 patients who measured Hb and BMD were included in the analysis. We defined anemia as Hb levels of < 13.0 g/dL and 12.0 g/dL for males and females, respectively. In addition, we further classified the patients into 4 groups according to anemia severity. The primary endpoint was the incidence of newly diagnosed anemia during follow-up. BMD measured by femur was used.

Results: The BMD levels was positively correlated with hemoglobin levels (β , 1.212; 95% confidence interval (CI), 0.738-1.686; $P < 0.001$). In the multivariable logistic regression model, the risk of anemia was significantly higher in the osteoporosis group than that in the normal BMD group (odds ratio (OR), 2.35; 95% CI, 1.31-4.21; $P = 0.004$). Among 1,132 patients without anemia at baseline, 429 (37.9%) patients developed anemia during a median follow-up duration of 3.5 years (3957 person-year). In the fully adjusted multivariable Cox models, a risk of incident anemia was significantly higher in the osteoporosis group (HR, 1.77; 95% CI, 1.01-3.10; $P = 0.045$) as compared to normal BMD group. In sensitivity analysis, the progression of anemia severity according to BMD level showed the consistent results.

Conclusions: This study showed that osteoporosis was associated with an increased risk for anemia in patients with non-dialysis CKD.

Keywords : chronic kidney disease (CKD), bone mineral density (BMD), Anemia

Table 1. Multivariable Cox regression model for development of anemia during follow-up

	Model 1 ^a		Model 2 ^b		Model 3 ^c		Model 4 ^d	
	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value
Femur BMD								
Normal	Reference		Reference		Reference		Reference	
Osteopenia	1.40 (1.11-1.78)	0.004	1.12 (0.86-1.46)	0.441	1.05 (0.79-1.39)	0.737	1.05 (0.79-1.40)	0.727
Osteoporosis	2.13 (1.25-3.60)	0.005	1.68 (0.99-2.86)	0.054	1.72 (0.98-3.01)	0.057	1.77 (1.01-3.10)	0.045

^aUnadjusted model

^bAdjusted for age, sex, CCI, smoking, low BMI, and ambulation status

^cAdjusted for Model 2 + iron deficiency, eGFR, LDL cholesterol, 25(OH) vitamin D, and log-FGF23

^dAdjusted for Model 3 + hypertension and diabetes mellitus

Abbreviations: BMD, bone mineral density; BMI, body mass index; CCI, Charlson comorbidity index; eGFR, estimated glomerular filtration rate; BMI, body mass index; FGF23, fibroblast growth factor-23; LDL, low density lipoprotein

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0095

Abstract Submission No. : APCN20250252

Association of Atherosclerotic Cardiovascular Disease, Vascular Dysfunction with Uremic Sarcopenia in Chronic Hemodialysis Patients

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Abstract

Objective: Atherosclerotic cardiovascular disease (ASCVD) and uremic sarcopenia are highly prevalent in patients undergoing chronic hemodialysis (HD). ASCVD and vascular dysfunction may impair skeletal muscle microperfusion, thereby negatively affecting muscle health. This study aimed to investigate the interplay between ASCVD, vascular function, and uremic sarcopenia in prevalent HD patients.

Materials and Methods: This cross-sectional study included 209 HD patients (mean age: 61.8 ± 12.9 years). ASCVD was defined as the presence of coronary artery disease (CAD), cerebrovascular disease (CVA), or peripheral arterial disease (PAD). Vascular assessments included cardio-ankle vascular index (CAVI), ankle-brachial index (ABI), and vascular reactivity index (VRI). Body composition was measured using a Body Composition Monitor (BCM), and appendicular skeletal muscle mass (ASM) was estimated using the equation: $-1.838 + 0.395 \times \text{total body water (L)} + 0.105 \times \text{body weight (kg)} + 1.231 \times \text{male sex} - 0.026 \times \text{age (years)}$. ASMI was defined as ASM (kg) divided by height squared (m²). Muscle function was evaluated by handgrip strength (HGS) and 6-meter gait speed (GS). Sarcopenia was diagnosed based on the criteria from the Asian Working Group for Sarcopenia 2019 (AWGS 2019), the European Working Group on Sarcopenia in Older People 2018, the Foundation for the National Institutes of Health Sarcopenia Project, and the International Working Group on Sarcopenia.

Results: The prevalence of CAD, CVA, PAD, and ASCVD was 35.4%, 10.0%, 23.9%, and 49.3%, respectively. Sarcopenia prevalence ranged from 31.1% to 48.8% across the four definitions. CAD, CVA, and PAD were significantly associated with slower GS; CAD and CVA were also associated with reduced ASMI. Overall, ASCVD was significantly associated with lower ASMI, HGS, and GS. In terms of sarcopenia risk, DM, CVA, and ASCVD were associated with 5.50-, 7.34-, and 2.98-fold increased odds of AWGS-defined sarcopenia, respectively. Among the vascular indices, average ABI showed a positive correlation with GS. However, CAVI and VRI were not significantly correlated with any skeletal muscle parameters.

Conclusions: This study demonstrated the high prevalence of ASCVD and uremic sarcopenia among prevalent HD patients. The strong associations between ASCVD, vascular dysfunction, and sarcopenia highlight the potential role of impaired vascular health in the pathogenesis of muscle loss. Targeting vascular health might be a key strategy for managing sarcopenia in this population.

Keywords : sarcopenia, atherosclerotic cardiovascular disease, vascular function, hemodialysis

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0096

Abstract Submission No. : APCN20250278

Chinese Nephrologists and Patients' Preference for the Treatment of Anemia in Chronic Kidney Disease: A Nationwide Multicenter Survey Based on Discrete Choice Experiments (CHANG'E Study)

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Abstract

Introduction: Anemia is a primary complication of chronic kidney disease (CKD). In recent years, there have been many effective strategies for treating anemia in CKD, including erythropoiesis-stimulating agents (ESAs), hypoxia-inducible factor prolyl hydroxylase inhibitors (HIF-PHIs), and erythropoietin (EPO) mimetic peptides (EMPs). The usage of these drugs also varies greatly. This investigation sought to systematically evaluate the treatment preferences of both nephrologists and patients (NAP) regarding renal anemia management strategies, in order to provide some perspectives for shared decision-making.

Methods: Discrete choice experiment (DCE) is a robust quantitative method grounded in random utility theory, enabling the systematic evaluation of individual preferences for multi-attribute alternatives in healthcare decision-making. The development process of the DCE questionnaire in this study was guided by the WHO DCE guidelines. Initially, a systematic review of qualitative and quantitative studies related to renal anemia was conducted using the PubMed database, which preliminarily identified the attributes of the preferences of NAP. Subsequently, a DCE questionnaire was developed through a three-round survey of NAP in China. In the first round, one-on-one interviews were conducted with NAP. A quota sampling method was used to set the criteria for sample inclusion, and semi-structured interviews based on a prepared interview outline were employed to extract 10–15 attributes that influence the medication decision-making of NAP. Secondly, an online questionnaire voting process was conducted among over 30 nephrology experts nationwide to further narrow down the attributes to 7–10. Thirdly, the final DCE questionnaire, which includes seven attributes and corresponding levels, was determined through an expert salon meeting at the lead institution. The formal survey will commence after the pilot survey is completed. This study will be conducted across multiple hospitals in 29 provinces and municipalities in China, with statistically representative samples selected and statistical calculations performed.

Results: The study expects 800 nephrologists and 3,000 patients to report preferences on efficacy, safety, administration, and costs. The pre-survey has been completed and the final DCE questionnaire has been determined. A nationwide survey is currently underway.

Conclusion: This approach not only identifies key drivers of choice behavior but also predicts acceptance rates for different anemia treatment strategies. This research holds significant value for optimizing patient-centered care and establishing an evidence-based framework for NAP treatment preferences. This study will facilitate the simulation of complex decision-making processes and provide a deep analysis of bridging the gap between clinical evidence, stakeholder priorities, and policy implementation.

Keywords : Anemia; Chronic kidney disease; Discrete choice experiment; Treatment preferences; Shared decision-making

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0097

Abstract Submission No. : APCN20250334

Fracture Risk Prediction In Chronic Kidney Disease: Comparing Bone Turnover Markers And Bone Mineral Density Performance In Dialysis And Non-Dialysis Populations

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Abstract

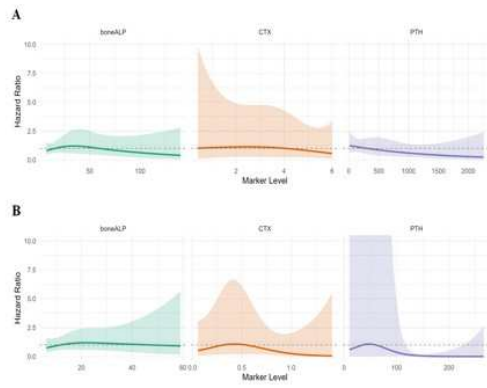
Introduction: Bone mineral density (BMD) is a recognized predictor of fracture risk in the general population, but its utility in patients with chronic kidney disease (CKD) remains uncertain due to heterogeneous bone turnover. This study evaluated the prognostic value of BMD and bone turnover markers (BTMs)—parathyroid hormone (PTH), C-terminal telopeptide of type I collagen (CTX), and bone-specific alkaline phosphatase (bone ALP)—for fracture risk in CKD patients, both with and without dialysis.

Methods: We retrospectively analyzed 853 adult patients with CKD who underwent BMD and BTM assessments between 2010 and 2024. Patients were stratified by dialysis status (RRT: n=514; non-RRT: n=339). Cox proportional hazards models adjusted for clinical covariates were used to assess fracture risk across tertiles of each marker and BMD category. Time-dependent receiver operating characteristic (ROC) curves were used to compare predictive performance for 5-year fracture risk.

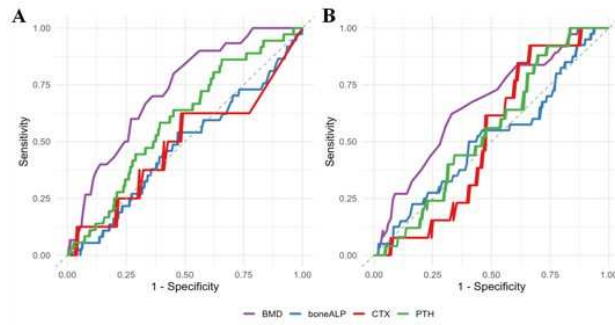
Results: Fracture risk did not differ significantly across tertiles of PTH, CTX, or bone ALP in either RRT or non-RRT groups. Spline analysis likewise demonstrated no meaningful nonlinear associations. In contrast, BMD was significantly associated with fracture risk in both groups: patients with osteoporosis (T-score ≤ -2.5) had markedly elevated risk in the RRT (adjusted HR 17.7, 95% CI 2.24–2288.2) and non-RRT groups (HR 14.5, 95% CI 1.80–1885.3). Time-dependent ROC analysis confirmed the superior predictive performance of BMD over BTMs for 5-year fracture risk, with AUCs of 0.712 (RRT) and 0.641 (non-RRT). No BTM outperformed BMD in either group.

Conclusion: BMD was a strong predictor of fracture risk in CKD patients, regardless of dialysis status. In contrast, bone turnover markers were not associated with fracture risk. These results support the role of BMD assessment in fracture risk evaluation in CKD.

Keywords : Chronic kidney disease-mineral bone disorder, Bone mineral density, Fracture risk, Dialysis, Bone turnover markers



Restricted cubic spline analyses of hazard ratios for fracture risk according to bone turnover markers in RRT (A) and non-RRT (B) groups



Time-dependent ROC Curves for 5-year fracture risk prediction in RRT (A) and non-RRT (B) patients.

RRT, renal replacement therapy; BMD, bone mineral density; Bone ALP, bone-specific alkaline phosphatase; CTX, C-terminal telopeptide of type I collagen; PTH, parathyroid hormone.

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0098

Abstract Submission No. : APCN20250360

Effectiveness of Setting Personalized Glycemic Targets in Improving Hyperglycemia Management Among Peritoneal Dialysis Patients

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Abstract

Background:

Diabetic nephropathy is one of the leading causes of End-Stage Renal Disease (ESRD). In Taiwan, the proportion of diabetic patients receiving dialysis has increased steadily, posing significant challenges to renal care. Peritoneal dialysis (PD) patients undergo daily exchanges with glucose-based dialysate, which results in substantial glucose absorption and further complicates glycemic control. Poor long-term glycemic control elevates the risk of infections, cardiovascular events, hospitalizations, and mortality, while significantly reducing quality of life. Glycated hemoglobin (HbA1c) and glycated albumin (GA) are commonly used markers to assess intermediate- to long-term glycemic status. This study aims to evaluate the effectiveness of personalized glycemic target setting in improving glycemic control among PD patients.

Methods:

This retrospective before-and-after study included PD patients from a dialysis center over a five-year period (January 2020 to May 2025). HbA1c or GA levels were monitored quarterly, with corresponding adjustments to hypoglycemic regimens. Case managers conducted continuous follow-up and health assessments, assisting patients in establishing personalized glycemic targets and care plans. These plans included weight management, dietary counseling, exercise guidance, and lifestyle modifications, with referrals to dietitians and diabetes educators as needed. For patients with HbA1c >7% or GA >20%, regular multidisciplinary team meetings were held to develop or adjust care strategies. Patients with HbA1c <5% were evaluated for hypoglycemia risk and nutritional status to prevent overtreatment and malnutrition.

Results:

Data analysis revealed that the proportion of PD patients with diabetes increased from 32.2% (28/87) in 2020 to 40.6% (26/64) in 2025, indicating a rising prevalence of diabetes in the PD population. Following the implementation of personalized glycemic targets and integrated care interventions, the proportion of patients not meeting glycemic goals decreased from 35.7% (10/28) to 19.23% (5/26), demonstrating the positive impact of structured, individualized management on glycemic control.

Conclusion:

Due to the glucose absorption associated with peritoneal dialysate, PD patients face unique challenges in glycemic management. Regular monitoring of HbA1c or GA, combined with personalized glycemic targets and multidisciplinary interventions, can significantly improve glycemic outcomes, reduce complications and mortality, and enhance patient quality of life and treatment satisfaction. It is recommended to set stricter targets (HbA1c <7% or GA <20%) for younger patients without significant comorbidities, and more relaxed targets (HbA1c <8% or GA <24%) for elderly or multimorbid patients, balancing efficacy and safety.

Keywords : peritoneal dialysis, personalized glycemic targets, glycated hemoglobin, glycated albumin

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0099

Abstract Submission No. : APCN20250375

Prevalence of Malnutrition and Its Effect on Health-Related Quality of Life Among Maintenance Hemodialysis Patients at East Avenue Medical Center

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Abstract

Introduction: Chronic Kidney Disease (CKD) is a significant global health issue, affecting 850 million people worldwide and ranking as the eighth leading cause of death in the Philippines. Hemodialysis patients are particularly vulnerable to malnutrition, with 20-70% of them affected. Various factors contribute to malnutrition in these patients, including metabolic acidosis, loss of appetite, nutrient loss during dialysis, underlying diseases, and insufficient dialysis. Regular nutritional assessments and increased awareness can help improve patients' nutritional status.

Methodology: This study investigates the link between nutritional status and quality of life in maintenance hemodialysis patients at East Avenue Medical Center. The study involved selecting patients based on inclusion and exclusion criteria, obtaining written informed consent, and collecting sociodemographic and medical history through interviews and medical records. Anthropometric measurements, including height, weight, and hand grip strength, were taken before dialysis. Data from routine laboratory tests such as hemoglobin, albumin, and Urea Reduction Ratio (URR) were analyzed, along with Kt/V determined via online clearance monitoring. Statistical analysis was performed using SPSS version 25, employing descriptive statistics, logistic regression analysis, and tests for normality.

Results: The study revealed that CKD is most prevalent in patients aged 51-69 and 18-35 years, with a higher percentage of patients having completed only high school education (42.5%) and being unemployed (82.2%). A significant proportion of patients had been on dialysis for 4 to 6 years, and 24.66% for 1 to 3 years. Malnutrition was indicated by low mid-arm circumferences and poor hand grip strength, with 95.89% classified as having "Very Poor" grip strength. Over half of the patients had hemoglobin levels below 100 g/L, indicating a high rate of anemia. Inadequate dialysis was noted, as nearly half the patients showed suboptimal dialysis efficacy based on URR and Kt/V ratios. A significant portion (94.52%) of patients were mildly malnourished, and only 4.48% were well-nourished. There was a weak negative correlation between malnutrition scores and quality of life among hemodialysis patients.

Conclusion: The study found a high prevalence of malnutrition, especially mild malnutrition, among maintenance hemodialysis patients. Factors such as dialysis vintage, inadequate dialysis, anemia, and poor dietary intake contribute to this issue, which negatively impacts the patients' health-related quality of life. The correlation between long-term dialysis and poor nutritional status emphasizes the importance of regular nutritional assessments. The study suggests that validated tools like the Modified Subjective Global Assessment should be used on a regular basis to lower the risk of malnutrition and improve clinical outcomes.

Keywords : Malnutrition, Chronic Kidney Disease, Modified Subjective Global Assessment , Hand Grip Strength, Mid Arm Circumference

RESULTS AND DISCUSSION

Table 3. Frequency and Percentage of Malnutrition Score Among Maintenance Hemodialysis Patients at CKD Unit

Malnutrition Score	Frequency	Percentage
Well Nourished	4	4.48
Mild Malnutrition	69	94.52
Moderate Malnutrition	0	0
Severe Malnutrition	0	0

A significant portion (94.52%) of patients were mildly malnourished, and only 4.48% were well-nourished. There was a weak negative correlation between malnutrition scores and quality of life among hemodialysis patients.

Table 5. Quality of life of CKD Patients

Quality of Life	Mean (SD)	Frequency	%
Good	71.9 (14.1)	48	65.8%
Poor	47.6 (6.63)	25	34.2%
Total	63.6 (16.7)	73	100%

The study of 73 hemodialysis patients revealed a significant disparity in quality of life, with 65.8% (48 patients) reporting "good" quality of life (mean score 71.9, SD 14.1) and 34.2% (25 patients) reporting "poor" quality of life (mean score 47.6, SD 6.63). The overall mean quality of life score was 63.6 (SD 16.7). The "good" quality of life group exhibited greater variability in scores than the "poor" group.



Table 6. Correlation between clinical profile and biochemical parameters with the Quality of Life CKD patients

		URR	Kt/v	BMI	Hand Grip	MUAC	Albumin	Hemoglobin	Malnutrition Score
KT/v	r_s	0.292	-	-	-	-	-	-	-
	p-value	<.001	-	-	-	-	-	-	-
BMI	r_s	-0.077	-0.110	-	-	-	-	-	-
	p-value	0.338	0.192	-	-	-	-	-	-
Hand Grip	r_s	-0.061	-0.029	0.019	-	-	-	-	-
	p-value	0.449	0.732	0.812	-	-	-	-	-
MUAC	r_s	0.024	-0.137	0.492	0.112	-	-	-	-
	p-value	0.767	0.116	<.001	0.173	-	-	-	-
Albumin	r_s	0.009	0.031	0.021	0.026	0.045	-	-	-
	p-value	0.916	0.717	0.800	0.749	0.585	-	-	-
Hemoglobin	r_s	0.184	-0.020	-0.050	0.027	0.164	-0.009	-	-
	p-value	0.023	0.813	0.532	0.735	0.048	0.913	-	-
Malnutrition Score	r_s	0.161	0.169	-0.075	-0.045	-0.228	-0.096	0.030	-
	p-value	0.063	0.065	0.385	0.603	0.010	0.275	0.730	-
QoL	r_s	-0.053	-0.087	-0.103	0.051	-0.013	0.195	0.031	-0.246
	p-value	0.540	0.342	0.235	0.556	0.883	0.027	0.724	0.009

Table 6 shows the correlation between clinical profile and biochemical parameters with the quality of life of CKD patients. The table displays correlation coefficients (r_s) and their corresponding p-values for various factors including URR, Kt/v, BMI, Hand Grip, MUAC, Albumin, Hemoglobin, Malnutrition Score, and Quality of Life (QoL). Statistically significant correlations (shaded values) are indicated, highlighting relationships between specific clinical/biochemical markers and QoL. The analysis used the KDQOL-SF Version 1.3 Filipino version. The "Symptom/problem list" demonstrated the highest mean score, suggesting a moderate level of symptom experience.

(shaded values have significant relationships between variables)

Figure 1. Scatter Plot for Quality of Life and Malnutrition Score among CKD patients

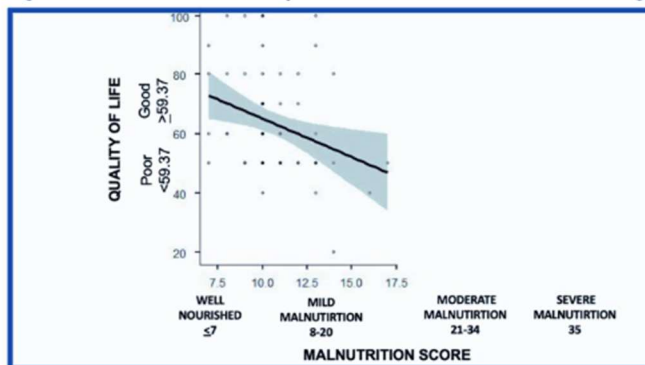


Figure 1's scatter plot shows a weak inverse correlation between malnutrition scores and quality of life in CKD patients. While higher malnutrition scores generally correspond to lower quality of life, the relationship isn't perfectly linear, suggesting other factors influence QoL.

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0100

Abstract Submission No. : APCN20250377

A Case Report on Severe Calcific Uremic Arteriopathy (CUA) and Steal Syndrome in a 30-year-old Filipino CKD Male: A Fatal Disease Vanquished

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Abstract

Introduction: Calciphylaxis, or calcific uremic arteriopathy (CUA), is a rare yet life-threatening disorder characterized by vascular calcification leading to skin necrosis, predominantly affecting patients with end-stage kidney disease (ESKD) on hemodialysis. Risk factors include secondary hyperparathyroidism and hyperphosphatemia, which exacerbate vascular calcification. Steal syndrome, caused by compromised distal perfusion from an arteriovenous fistula (AVF), may further complicate management. This case report highlights a 30-year-old Filipino male with ESKD who presented with concurrent calciphylaxis and steal syndrome.

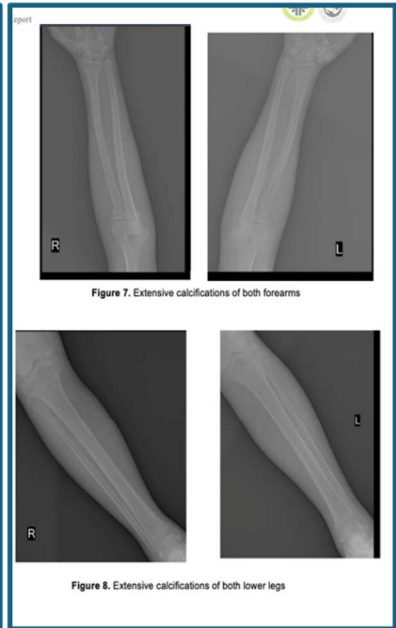
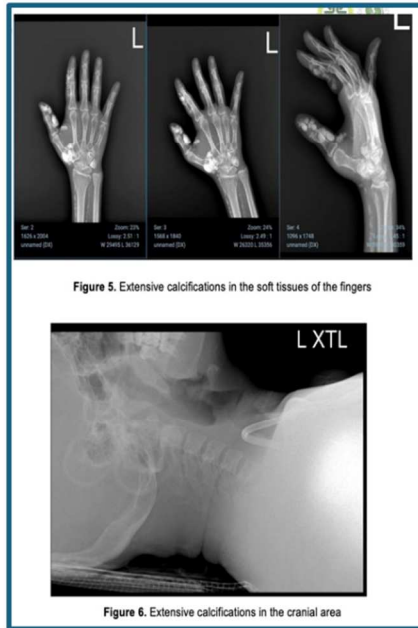
Case Presentation: The patient, on chronic hemodialysis via a left arm AVF, developed progressively worsening painful necrotic skin lesions on his fingers and penile area over six months. The pain intensified during and after dialysis. Days before admission, the third and fourth digits of his left hand became gangrenous. Examination revealed tender, gangrenous phalanges and penile lesions, with radiographs showing extensive soft tissue and vascular calcifications. Laboratory tests indicated severe hyperparathyroidism (PTH 2400 pg/mL), hyperphosphatemia (10 mg/dL), and elevated inflammatory markers. Emergent surgical intervention included ray amputation of necrotic digits and AVF takedown due to symptomatic steal syndrome. A temporary dialysis catheter was inserted for continued renal replacement therapy.

Management Discussion: A multidisciplinary approach was implemented, involving nephrology, surgery, dermatology, and wound care. Key interventions included intensified hemodialysis (six times weekly) to improve calcium-phosphorus balance, intravenous sodium thiosulfate (25 grams in 100 mL sterile water during dialysis) to chelate calcium deposits, and non-calcium phosphate binders (sevelamer) alongside cinacalcet and vitamin D analogs to control mineral metabolism. Broad-spectrum antibiotics managed superimposed infections. Aggressive wound care with debridement facilitated healing, while pain was managed with appropriate analgesics. Over three months, the patient experienced significant pain relief, resolution of necrotic lesions, normalization of calcium-phosphate levels, and a reduction in PTH levels. He was eventually discharged with continued outpatient sodium thiosulfate therapy and wound care.

Conclusion: This case emphasizes the importance of early recognition and prompt multidisciplinary management of calciphylaxis, particularly in patients with severe CKD-MBD. Sodium thiosulfate therapy, in conjunction with metabolic control and intensified dialysis, was effective in managing this complex case, offering pain relief and improved outcomes. Despite the high mortality associated with calciphylaxis, coordinated care and innovative therapies can enhance survival and quality of life in affected patients.

Keywords : Severe Extensive Calcification, Cranial Calcification, Penile Calciphylaxis, Steal Syndrome, Chronic Kidney Disease, Hyperparathyroidism, Sodium thiosulfate, Cinacalcet

A Case Report on Severe Calcific Uremic Arteriopathy (CUA) and Steal Syndrome in a 30-year-old Filipino CKD Male: A Fatal Disease Vanquished



Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0102

Abstract Submission No. : APCN20250424

Rooting for Better Kidneys: The Impact of Plant-Based Diets on CKD

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Abstract

Objectives: Dietary modifications are an essential component of chronic kidney disease (CKD) management, aiming to slow disease progression and reduce complications. Plant-based diets have emerged as a promising alternative to traditional renal diets, particularly in resource-limited settings like India. This study explores the benefits and challenges of plant-dominant low-protein diets (PLADO) in CKD patients.

Methods: A comprehensive review of published research was conducted using PubMed, ScienceDirect, and Google Scholar. Studies available until April 30, 2025, were analyzed using search terms such as “plant-based renal diet,” “low-protein vegetarian diet,” and “CKD nutritional therapy.” Data were synthesized to assess the impact of plant-based diets on kidney function and overall patient health.

Results: Adopting a plant-dominant diet with a protein intake of 0.6–0.8 g/kg/day can positively influence renal function by reducing uremic toxin levels, improving gut microbiome composition, and mitigating oxidative stress. Comparative studies indicate that diets rich in animal protein may accelerate glomerular hyperfiltration, while plant-based proteins exhibit a kidney-protective effect. Additionally, vegetarian renal diets have been linked to better blood pressure regulation, reduced cardiovascular disease risk, and improved metabolic health. However, concerns such as inadequate essential amino acid intake and the need for dietary counseling remain key considerations in clinical practice.

Conclusions: Plant-based diets represent a viable and culturally adaptable approach to CKD management in India. Healthcare professionals, including nephrologists and dietitians, should emphasize structured dietary interventions, patient education, and long-term monitoring to optimize renal outcomes. Further clinical studies are needed to develop tailored dietary guidelines specific to the Indian population.

Keywords : Plant Based Diets, CKD

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0103

Abstract Submission No. : APCN20250442

The Dose of Erythropoiesis-Stimulating Agents and Mortality in Dialysis

Patients: A National Study from Taiwan

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Abstract

Background : The dose of erythropoiesis-stimulating agents (ESAs) has been associated with mortality in dialysis patients, and dosing practices vary across countries. This study aims to investigate the association between ESA dose and mortality among dialysis patients in Taiwan.

Methods : We used the Taiwan Renal Data System (TWRDS) to identify dialysis patients and to retrieve the quarterly dose of ESA. Only patients with no missing data for the quarterly ESA dose were included. Demographics, comorbidities, and laboratory data were also retrieved from the TWRDS as covariates. Outliers in laboratory data were treated as missing values, and imputation was performed for missing data. Multivariable Cox proportional hazards models were used to investigate the association between tertile-stratified ESA dosing groups and mortality. A restricted cubic spline model was constructed to investigate the nonlinear association between ESA dose and mortality.

Results : A total of 14,092 patients who initiated dialysis between January 1, 2009, and December 31, 2019, were selected for analysis. The monthly ESA dose was $16,086 \pm 9,700$ U (mean \pm standard deviation). The monthly ESA dosing remained constant from January 2010 to December 2022. When patients were stratified according to the tertiles of monthly ESA dose, higher ESA dosing was associated with higher age, a greater proportion of females, lower hemoglobin levels, and a higher frequency of comorbidities, including cardiovascular diseases, malignancy, and cirrhosis. Among the three different ESA dose groups, patients in the medium ESA dose group (13,000 – 20,000 U/month) had the lowest crude mortality at 3 years. Compared with the medium ESA dose group, both the low ESA dose group (<13,000 U/month) and the high ESA dose group (>20,000 U/month) had increased mortality risk in the multivariable Cox models [Low dose: hazard ratio (HR) 1.10, 95% confidence interval (CI) 1.03-1.16; High dose: HR 1.10, 95% CI 1.03-1.17]. The restricted cubic spline plot showed an U-shaped association between ESA dosing and mortality (Figure 1). Subgroup analysis yielded consistent results.

Conclusion : The ESA dosing among Taiwan dialysis patients has remained stable at around 16,000 U/month from 2010 to 2022. The association between ESA dose and mortality is U-shaped. Whether an extremely low ESA dose confers hemoglobin-independent mortality risk in dialysis patients warrants further study.

Keywords : end-stage kidney disease, anemia, mortality risk

Figure 1. The non-linear associations between erythropoietin-stimulating agents dose and mortality in Taiwan dialysis patients.

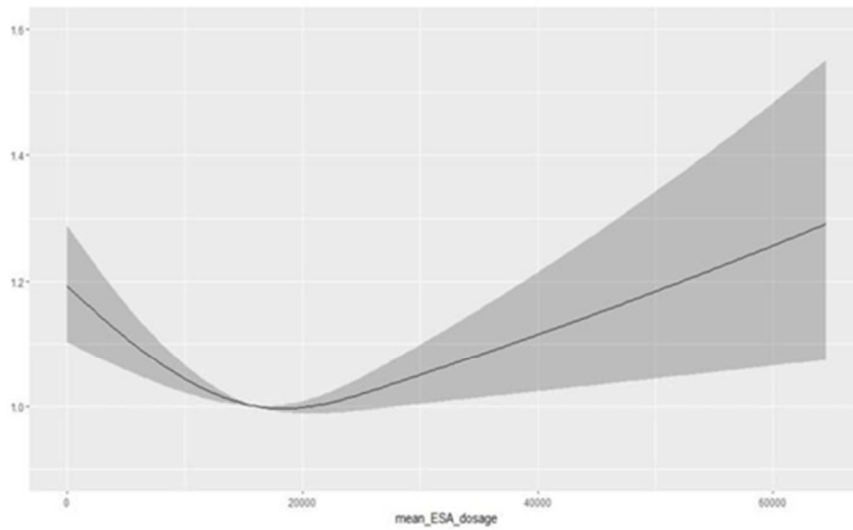


Figure 1. The association between ESA dosage and mortality risk in the restricted cubic spline model. Covariates including age, sex, comorbid diabetes mellitus, comorbid hypertension, comorbid dyslipidemia, comorbid coronary artery disease, comorbid heart failure, comorbid stroke, comorbid cancer, comorbid cirrhosis, comorbid chronic hepatitis, and baseline laboratory data (including hemoglobin, albumin, sodium, potassium, calcium, and phosphate) were adjusted for. Abbreviation: ESA, erythropoietin-stimulating agent

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0104

Abstract Submission No. : APCN20250575

Evaluate the Effect of Four-Session Individualized Nutrition Counseling Program on Serum Phosphorus Levels in Hemodialysis Patients

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Abstract

Background: Hyperphosphatemia is a prevalent and challenging complication in patients undergoing hemodialysis, contributing to vascular calcification and increased mortality risk. Dietary phosphorus intake plays a main role in managing serum phosphorus levels. It is necessary to evaluate the effect of a individualized nutritional counseling program on hemodialysis serum phosphorus for the first time in Mongolia.

Objective: To evaluate the effect of a four-session individualized nutrition counseling program on serum phosphorus levels in hemodialysis patients.

Methods: A prospective intervention study was conducted involving 50 hemodialysis patients (three times weekly for the duration of three hours each session). Participants received four personalized nutrition counseling sessions over a four-month period, focusing on reducing dietary phosphorus intake while maintaining adequate protein consumption. Nutritional assessments and laboratory tests were performed at baseline and every month after the start of the intervention.

Results: Post-intervention exhibited a significant reduction in serum phosphorus levels ($p < 0.01$). Additionally, the calcium-phosphorus product was significantly reduced ($p < 0.05$). Patient knowledge regarding phosphorus management improved, with increased adherence to dietary recommendations.

Conclusion: A structured four-session nutrition counseling program effectively lowers serum phosphorus levels in HD patients without compromising nutritional status. This approach offers a feasible and impactful strategy for managing hyperphosphatemia in hemodialysis populations.

Keywords : Hemodialysis, hyperphosphatemia, nutrition counseling, serum phosphorus, dietary intervention.

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0105

Abstract Submission No. : APCN20250640

Validation of the ISRNM Diagnostic Criteria for Protein-Energy Wasting Against the Malnutrition-Inflammation Score in Patients With Chronic Kidney Disease

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Abstract

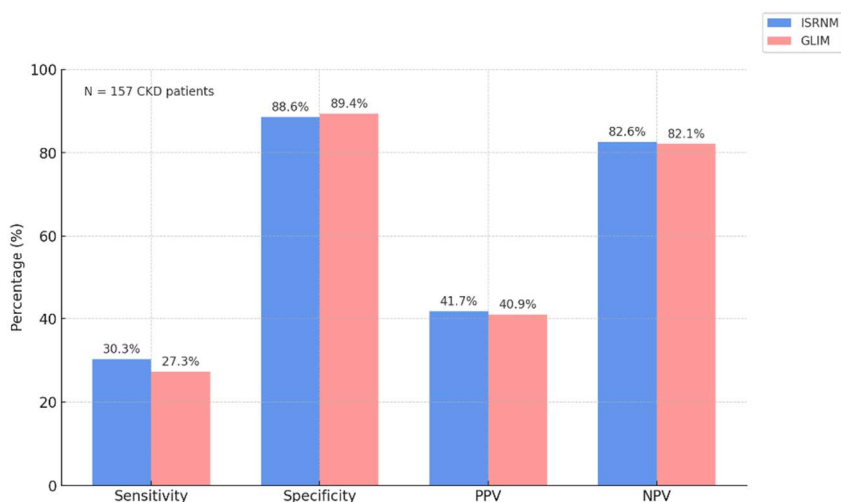
Background: Protein-energy wasting (PEW) is a prevalent and clinically significant complication in patients with chronic kidney disease (CKD). The International Society of Renal Nutrition and Metabolism (ISRNM) has proposed diagnostic criteria for PEW. However, their diagnostic validity relative to established tools such as the Malnutrition-Inflammation Score (MIS) has not been well characterized in nondialysis CKD populations.

Methods: In this cross-sectional study, we assessed 157 patients with CKD stages 3–5 from a prospective cohort focused on nutritional evaluation. PEW was diagnosed using the ISRNM and Global Leadership Initiative on Malnutrition (GLIM) criteria and compared against MIS (cutoff ≥ 5) as the reference standard. Diagnostic performance was evaluated using sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and Cohen's kappa coefficient.

Results: The ISRNM criteria demonstrated a kappa of 0.210, with sensitivity of 30.3%, specificity of 88.6%, PPV of 41.7%, and NPV of 82.6% relative to MIS. The GLIM criteria showed similar performance (kappa: 0.190; sensitivity: 27.3%; specificity: 89.4%; PPV: 40.9%; NPV: 82.1%). Both criteria exhibited high specificity and NPV but poor sensitivity, suggesting substantial underdiagnosis of PEW compared to MIS.

Conclusion: While the ISRNM and GLIM criteria reliably exclude PEW when negative, their limited sensitivity constrains their use as screening tools. The low agreement with MIS may reflect differences in underlying constructs, as MIS incorporates inflammatory markers, whereas ISRNM and GLIM emphasize anthropometric and dietary components. Integrating functional or inflammatory markers may improve early identification of malnutrition in CKD.

Keywords : Chronic kidney disease, GLIM, ISRNM, Malnutrition Inflammation Score, protein-energy wasting



Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0106

Abstract Submission No. : APCN20250642

Association Between Serum Per- and Polyfluoroalkyl Substances and Iron Status Biomarkers in a Representative Sample of U.S. Adults: NHANES 2013-2018

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Abstract

Per- and polyfluoroalkyl substances (PFAS) comprise a class of man-made compounds widely utilized in manufacturing everyday consumer products. Experimental studies indicate that PFAS may interfere with iron regulation by hindering absorption or inducing oxidative stress. Nonetheless, epidemiological studies examining the association between PFAS exposure and a broad spectrum of iron-related biomarkers remain scarce. In this study, we analyzed data from the 2013-2018 National Health and Nutrition Examination Survey (NHANES), which included 5,050 adults aged 18 and older. We investigated the relationships between six PFAS compounds, oral iron intake, and a comprehensive set of markers of iron homeostasis, including serum iron, unsaturated iron-binding capacity (UIBC), total iron-binding capacity (TIBC), transferrin saturation, ferritin, and transferrin receptor levels. Our findings revealed a negative association between both individual and total PFAS (sum of six PFAS) levels and oral iron intake. Additionally, Serum iron and transferrin saturation levels exhibited significant positive correlations with all PFAS compounds, whereas ferritin was positively correlated with all PFAS compounds except n-perfluorooctanoic acid (n-PFOA). UIBC and transferrin receptor showed significant negative correlations with all PFAS compounds, while TIBC was significantly negatively correlated with n-perfluorooctane sulfonic acid (n-PFOS), perfluoromethylheptane sulfonic acid isomers (Sm-PFOS), perfluorohexane sulfonic acid (PFHxS), and the total PFAS. Moreover, as total PFAS quartiles increased, we observed significant trends of rising serum iron, transferrin saturation, and ferritin, and declining UIBC and transferrin receptor levels, with trend P-values of 0.003, 0.012, 0.016, < 0.001, and < 0.001, respectively. In conclusion, we found that higher PFAS exposure was associated with altered iron status biomarkers. If this correlation is causal, it suggests that PFAS exposure may lead to increased iron absorption. These findings emphasize the need for additional research into the potential impact of PFAS exposure on iron homeostasis.

Keywords : Ferritin; Iron homeostasis; National Health and Nutrition Examination Survey (NHANES); Per- and polyfluoroalkyl substances (PFAS); Serum iron; Transferrin receptor.

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0107

Abstract Submission No. : APCN20250666

Denosumab vs. Parathyroidectomy: Effects on Vascular Calcification and Bone Health in Dialysis Patients with SHPT

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Abstract

Background

Secondary hyperparathyroidism (SHPT) leads to significant bone loss and vascular calcification in dialysis patients. Although parathyroidectomy (PTX) is effective, many patients face delays due to the need for preoperative cardiovascular assessment. Denosumab, a RANKL inhibitor, may serve as an early therapeutic alternative in such cases.

Objective

To compare the 6-month effects of denosumab and PTX on bone mineral density (BMD), vascular calcification, and serum mineral profiles in dialysis patients with SHPT.

Methods

In this prospective study, dialysis patients with severe SHPT (PTH >800 ng/mL) were assigned to denosumab (60 mg, n=25), PTX (n=25), or control (n=25). Serum calcium, phosphate, and alkaline phosphatase levels were measured. BMD at the lumbar spine (LS) and femoral neck (FN) was assessed at baseline and 6 months. Coronary artery calcification (CAC) was evaluated using modified Hokanson criteria (regression: < -2; stable: -2 to 2; progression: >2).

Results

Both denosumab and PTX significantly improved BMD (LS: +12.6% vs. +9.6%; FN: +15.2% vs. +13.8%; all P < 0.01 vs. controls). FN-BMD changes positively correlated with baseline serum alkaline phosphatase (r = 0.681 and 0.660, P < 0.01). Hypocalcemia and hypophosphatemia were observed post-treatment in both groups (P < 0.01). CAC regression occurred in 36% of the denosumab group and 24% of the PTX group, with none in controls.

Conclusion

Both denosumab and PTX significantly enhance BMD and may attenuate vascular calcification in dialysis patients with SHPT. Denosumab represents a practical bridge therapy for patients awaiting PTX.

Keywords : Denosumab, Parathyroidectomy, Bone Mineral Density, Vascular Calcification, Dialysis, Secondary Hyperparathyroidism

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0108

Abstract Submission No. : APCN20250667

Baseline Hemoglobin as a Clinical Indicator for Renal Function Decline in Older Adults: Findings from a Taiwanese Community-Based Cohort

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Abstract

Background:

Anemia commonly occurs alongside kidney dysfunction. However, the relationship between baseline hemoglobin levels and subsequent renal function decline in a healthy aging population remains unclear. This study aims to investigate the impact of varying baseline hemoglobin levels on renal function over time using a prospective community-based cohort in Taiwan.

Methods:

The Healthy Aging Longitudinal Study followed a community-based cohort of Taiwanese adults aged 55 years and older ($n = 2,566$) over an average period of 5.64 years. The study assessed the association between baseline hemoglobin levels (measured during 2009–2013) and renal function at follow-up (2013–2020), as well as the rate of renal function decline. Renal function was evaluated at both time points using estimated glomerular filtration rate (eGFR), calculated based on age, sex, and serum creatinine levels. The annual rate of eGFR decline was determined by dividing the change in eGFR by the follow-up duration. Linear regression was used to examine the association between baseline hemoglobin levels and the rate of renal function decline. Progression to chronic kidney disease (CKD), defined as an eGFR below 60 mL/min/1.73 m², was assessed using logistic regression models.

Results:

Higher baseline hemoglobin levels were significantly associated with higher follow-up eGFR ($\beta = 0.04$, $p = 0.0427$) and a slower rate of eGFR decline ($\beta = -0.13$; 95% confidence interval [CI]: -0.20 to -0.06). These inverse associations between hemoglobin levels and eGFR decline were also observed in subgroups with a urinary albumin-to-creatinine ratio (UACR) <30 mg/g ($\beta = -0.07$; 95% CI: -0.14 to -0.002) and UACR between 30 and 300 mg/g ($\beta = -0.40$; 95% CI: -0.61 to -0.18). Participants in the highest quartile of baseline hemoglobin had a 55% lower risk of developing CKD (eGFR <60 mL/min/1.73 m²) compared to those in the lowest quartile (Risk Ratio = 0.45; 95% CI: 0.30 to 0.66). These associations remained robust in subgroup analyses of participants with hypertension and diabetes.

Conclusions:

Higher baseline hemoglobin levels were associated with a slower rate of renal function decline in older adults, independent of albuminuria status, hypertension, or diabetes.

Keywords : Anemia, hemoglobin, renal function decline, aging, albuminuria

Table 1 Association between baseline Hemoglobin and renal function decline, stratified by the presence of albuminuria

Y : (eGFR _B - eGFR _F)/Year	Model-1		Model-2		Model-3*		Model-4**	
Baseline variables	Beta	95% C.I.	Beta	95% CI	Beta	95% CI	Beta	95% CI
Age, yrs	0.02	(0.01, 0.03)	0.01	(0.003, 0.02)	0.01	(0.003, 0.02)	0.01	(0.001, 0.02)
Gender, female vs. Male	0.08	(-0.09, 0.26)	0.12	(-0.06, 0.29)	0.11	(-0.08, 0.30)	0.06	(-0.14, 0.25)
Systolic blood pressure, mmHg			0.01	(0.01, 0.01)	0.01	(0.01, 0.01)	0.01	(0.01, 0.02)
Glucose, mg/dL			0.01	(0.006, 0.01)	0.01	(0.005, 0.01)	0.01	(0.006, 0.01)
Hemoglobin	-0.11	(-0.18, -0.04)	-0.14	(-0.21, -0.08)	-0.15	(-0.21, -0.08)	-0.13	(-0.20, -0.06)
UACR < 30, n=2186								
Age, yrs	0.02	(0.01, 0.03)	0.02	(0.006, 0.03)	0.02	(0.006, 0.03)	0.01	(0.004, 0.03)
Gender, female vs. Male	-0.002	(-0.18, 0.18)	0.02	(-0.16, 0.20)	0.02	(-0.18, 0.22)	-0.04	(-0.24, 0.16)
Systolic blood pressure, mmHg			0.01	(0.002, 0.01)	0.01	(0.002, 0.01)	0.01	(0.003, 0.01)
Glucose, mg/dL			0.002	(-0.001, 0.01)	0.002	(-0.001, 0.01)	0.003	(0.000, 0.01)
Hemoglobin	-0.08	(-0.15, -0.01)	-0.09	(-0.16, -0.02)	-0.09	(-0.16, -0.02)	-0.07	(-0.14, -0.002)
30 ≤ UACR < 300, n=350								
Age, yrs	0.000	(-0.03, 0.03)	-0.01	(-0.038, 0.02)	-0.01	(-0.043, 0.02)	-0.01	(-0.041, 0.03)
Gender, female vs. Male	0.71	(0.16, 1.26)	0.77	(0.23, 1.30)	0.87	(0.26, 1.49)	0.85	(0.23, 1.47)
Systolic blood pressure, mmHg			0.01	(-0.002, 0.02)	0.01	(-0.004, 0.02)	0.01	(0.00, 0.02)
Glucose, mg/dL			0.01	(0.009, 0.02)	0.02	(0.009, 0.02)	0.02	(0.009, 0.02)
Hemoglobin	-0.27	(-0.48, -0.07)	-0.37	(-0.57, -0.16)	-0.37	(-0.58, -0.17)	-0.40	(-0.61, -0.18)

Dependent variable: eGFR at baseline minus eGFR at follow-up divided by follow-period in year [(eGFR_B- eGFR_F)/Years].

The higher rate indicates the renal function decline faster.

*: adjusted for uric acid, smoking, drinking, physical activity, self-reported histories of gout, stroke, and heart disease

**: adjusted for uric acid, smoking, drinking, physical activity, self-reported histories of gout, stroke, heart disease, and albumin

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0109

Abstract Submission No. : APCN20250686

Impact of Tenapanor Hydrochloride on Serum Zinc and Copper Levels in Maintenance Hemodialysis Patients: Analysis Including Additional Trace Metal Testing

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Abstract

Introduction:

Tenapanor hydrochloride, an NHE3 inhibitor, is a novel therapeutic agent used to reduce serum phosphate levels in maintenance hemodialysis patients. While its efficacy in phosphorus control has been reported, its potential effects on trace metal metabolism—particularly zinc and copper—remain unclear. To address this, we included additional targeted trace metal testing in this study.

Methods:

We performed a cross-sectional analysis at a single dialysis center. Patients were divided into Tenapanor and non-Tenapanor groups. In addition to routine blood tests, we specifically measured serum zinc and copper levels using trace metal-specific blood collection tubes during the study period. Multivariable linear regression was applied to assess independent associations, adjusting for albumin, CRP, and zinc supplementation status.

Results:

A total of 384 patients were enrolled. The Tenapanor group demonstrated significantly lower serum zinc levels compared to the non-Tenapanor group ($p = 0.02$). No significant difference was observed in serum copper levels. Multivariable analysis confirmed that Tenapanor use was independently associated with reduced zinc concentration ($\beta = -0.147$, $p < 0.05$). Serum copper was not significantly affected. The additional trace metal testing reinforced the reliability of the measurements, with quality-controlled sampling and consistent inter-assay results.

Conclusion:

Tenapanor use appears to be associated with a decline in serum zinc levels, based on both routine and targeted trace element testing. This suggests that Tenapanor may influence zinc absorption or excretion in hemodialysis patients. Although copper levels remained unaffected, careful monitoring of zinc status should be considered during Tenapanor therapy, particularly in long-term use. Further prospective studies are warranted.

Encore Statement:

This abstract was also submitted for the 70th Annual Meeting of the Japanese Society for Dialysis Therapy.

Keywords : Tenapanor, Zinc, Copper, Hemodialysis, Trace Elements

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0110

Abstract Submission No. : APCN20250694

Deceptive Masquerader - An Unusual Cause Of Anemia In A Patient With Chronic Kidney Disease On Dialysis

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Abstract

Background

Anemia is common in the chronic kidney disease (CKD) population undergoing hemodialysis. Its multifactorial causes include erythropoietin deficiency and impaired iron metabolism. However, a subset of patients exhibit anemia resistant to conventional management. This case highlights the importance of exploring rare causes of anemia in dialysis patients.

Case Presentation

A 68-year-old man with a 25-year history of type 2 diabetes mellitus and systemic hypertension presented with exertional shortness of breath (1 month) and fatigue (6 months). Diagnosed with end-stage renal disease (ESRD). 3 months prior, he had started hemodialysis due to uremia and required multiple blood transfusions. The patient had hepatitis C virus (HCV) genotype 1A infection, treated with direct-acting antivirals and achieved sustained virologic response. Despite iron and vitamin repletion and weekly darbepoetin, he continued to experience chronic anemia and frequent transfusions.

Lab Investigations

Investigations revealed anemia with reticulocytosis (13%), elevated lactate dehydrogenase (LDH), and a positive direct Coombs test (DCT). Indirect Coombs test was positive for IgG3 antibodies and negative for complement C3, consistent with warm autoimmune hemolytic anemia (AIHA).

Treatment

Initial oral steroids (1 mg/kg) were started. Due to non-response, azathioprine 100 mg daily was added but stopped because of bone marrow suppression. The patient received four weekly doses of rituximab 100 mg and sirolimus 1 mg twice daily. Following immunosuppressive therapy, hemoglobin improved without further transfusions, allowing cessation of steroids while continuing darbepoetin.

Take Home Points

1. AIHA is an under-recognized cause of anemia in dialysis patients due to its rarity and heterogeneous presentation.
2. A high index of suspicion is needed to identify uncommon causes beyond CKD-related anemia.
3. Identifying triggers, such as HCV infection, is crucial for targeted therapy. Enhanced understanding of AIHA in this population can improve outcomes, reduce transfusion dependence, and prevent unnecessary hospitalizations.

Keywords : Anaemia, warm immune hemolytic anaemia

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0111

Abstract Submission No. : APCN20250701

Long-Term Prognosis of Adenine phosphoribosyltransferase Deficiency in Japanese: A Literature Review

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Abstract

Introduction: Adenine phosphoribosyltransferase (APRT) deficiency is an autosomal recessive purine metabolism disorder causing urolithiasis and CKD. It is classified as type I (complete deficiency) or type II (partial deficiency). Type II, linked to the APRT*J allele, has been reported only in Japanese patients. However, no study has examined genotype differences or long-term outcomes in this population. To address this, we conducted a literature review to clarify the clinical features and prognosis of Japanese patients with APRT deficiency.

Methods: A comprehensive search using PubMed and Ichushi-Web identified original articles in English or Japanese on Japanese patients with APRT deficiency with available full texts. Duplicates and reviews without patient data were excluded.

Results: A total of 77 articles from PubMed and 46 from Ichushi-Web were screened, and one of our cases was included, resulting in 29 cases being analyzed. Among them, 17 patients were male, and the median age at diagnosis was 14 years, with 13 cases diagnosed in adulthood. The median follow-up period was 2.5 years. Genetic analysis was performed in 25 cases, with 23 (85%) identified as type II and only two adult cases of type I included. Regarding the mode of diagnosis, 51.7% of cases presented with symptoms such as renal colic, urinary tract infection, gross hematuria or severe kidney dysfunction, while 44.8% were incidentally detected kidney stones or mild kidney dysfunction during health checkups or evaluations for unrelated conditions. At diagnosis, kidney dysfunction was noted in 9 cases, including one infant and two patients diagnosed at the time of kidney transplantation for ESKD of unknown cause. The median serum creatinine-based eGFR at diagnosis was lower in adults than in children (40.8 vs. 102.4 mL/min/1.73m²), although the difference was not statistically significant (p=0.087). After diagnosis, 25 cases received xanthine oxidase inhibitors, with 3 additionally receiving citrate preparations and 8 undergoing dietary modifications. No recurrence of renal colic or progression of nephrolithiasis was observed in 18 cases followed for over one year. However, kidney function remained unimproved in 4 cases with severe dysfunction at diagnosis.

Conclusion: To the best of our knowledge, this is the first report clarifying the clinical features of type II APRT deficiency in Japan. Our findings suggest that type II is not necessarily milder, as previous reports on type I showed that untreated or inadequately treated patients remain at risk of progressive and potentially irreversible kidney dysfunction. Further long-term data are needed to optimize management and prognosis.

Keywords : APRT deficiency, chronic kidney disease, kidney stone

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0112

Abstract Submission No. : APCN20250718

Intracellular Water and Handgrip Strength : A Biospectroscopy-Based Assessment of Muscular Health

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Abstract

Objective

To assess the association of biospectroscopy-derived metrics—particularly ICW and BCM—with handgrip strength, and how these associations differ by sex.

Methods

This cross-sectional study analyzed data from 448 individuals with complete bioimpedance and handgrip strength data. Key metrics included Body Cell Mass (BCM), Intracellular Water (ICW), Extracellular Water (ECW), and hydration ratios (E/I). Handgrip strength was averaged across both hands and classified as 'low' or 'normal' using EWGSOP2 sex-specific cutoffs. Statistical methods included Pearson correlations, linear and logistic regression, and ridge regression to handle multicollinearity.

Results

ICW was the strongest correlate of handgrip strength ($r = 0.53$), outperforming BCM and BMI. Linear regression revealed a significant ICW \times sex interaction ($p = 0.017$), indicating a stronger positive effect in males. Ridge regression and logistic models confirmed ICW's robust association with strength classification, even after adjusting for age, BMI, and hydration status.

Conclusion

Intracellular water (ICW) is a robust and sex-sensitive biomarker of handgrip strength. It demonstrates superior predictive value compared to BCM or BMI alone. These findings support the use of ICW in clinical screening for muscle function and sarcopenia risk.

Keywords : Body Cell Mass (BCM), Intracellular Water (ICW)

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0113

Abstract Submission No. : APCN20250849

Automated Intravenous Iron Delivery Improves Iron Stores and Reduces ESA Utilization in Hemodialysis Patients: A Single-Center Before–After Study

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Abstract

Background Intravenous (IV) iron is pivotal for correcting iron-restricted anemia in chronic hemodialysis (HD), yet manual dose titration is labor-intensive and often inconsistent.

Methods We performed a single-center, before-and-after study enrolling 146 HD patients whose anemia management switched from physician-directed to an automated IV-iron prescription system on 16 May 2019. Baseline demographics and comorbidities were balanced between periods.

Results During the 12-month post-implementation phase, mean ferritin rose from 230 ± 133 to 265 ± 153 ng/mL ($p = 0.013$), while hemoglobin remained stable (9.3 ± 0.8 vs 9.3 ± 0.7 g/dL, $p = 0.565$) and the proportion achieving $Hb \geq 9.5$ g/dL was unchanged (93.1 % vs 92.4 %; $p = 0.763$). Weekly erythropoiesis-stimulating agent (ESA) use fell by 14 % ($3\,397 \pm 1\,800$ to $2\,913 \pm 1\,787$ IU; $\Delta -484$ IU, $p = 0.001$), with a cumulative reduction of 25 233 IU per patient-year, and a significant downward ESA trend across successive quarters (p -trend = 0.043).

. Blood transfusion demand showed a non-significant increase (29.5 % to 37.0 %; $p = 0.054$).

Conclusions Algorithm-driven IV-iron delivery safely increases iron stores and substantially lowers ESA requirements without compromising hemoglobin control in HD patients. Such automation can streamline anemia management and may curtail ESA-related costs and risks in high-volume dialysis programs.

Keywords : Iron supply, Hemodialysis, Anemia, Erythropoiesis-Stimulating Agents

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0114

Abstract Submission No. : APCN20250851

The Correlation between Serum Carnitine and Sarcopenia in Hemodialysis Patients: From Biomarker Screening to L-Carnitine Treatment Validation

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Abstract

Background and Objective: Sarcopenia is highly prevalent in hemodialysis (HD) patients and is associated with poor prognosis. This study aimed to explore whether serum carnitine levels could serve as biomarkers for sarcopenia in HD patients and investigated the impact of L-carnitine supplementation on reducing the incidence of sarcopenia, lowering the risk of adverse events, and improving patient outcomes.

Methods: This study included 442 patients who received treatment at the Blood Purification Center, with a treatment duration of ≥ 3 months and an age of ≥ 18 years. Clinical data and muscle-related parameters were recorded. Targeted liquid chromatography-tandem mass spectrometry was used to detect 29 serum metabolites.

This study is divided into Cross-Sectional Study and Prospective Study.

Results:

1. Cross-Sectional Study: Among patients with sarcopenia, the ratio of acylcarnitine to C0 was higher, and the proportion of carnitine metabolism disorders was also higher ($P < 0.05$). After adjusting for age, sex, and dialysis duration, showed that disturbed CM significantly increased the risk of sarcopenia by 1.93 times. Multivariate linear regression analysis indicated that a lower skeletal muscle mass index was associated with disturbed CM ($\beta = -0.24$, $P = 0.042$). L-carnitine supplementation significantly increased C0 and total carnitine levels ($P < 0.05$), positively affecting carnitine levels in dialysis patients.

2. Prospective Study: After 2 years of follow-up, multivariate Cox regression analysis indicated that disturbed CM ($HR = 3.37$, $95\%CI: 1.51-7.53$, $P = 0.003$) significantly increased the risk of falls, while L-carnitine supplementation ($HR = 0.38$, $95\%CI: 0.17-0.82$, $P = 0.014$) significantly reduced the risk of falls. The ROC curve for fall risk prediction based on the nomogram, including gender, age, L-carnitine supplementation, and disturbed CM, demonstrated good predictive performance at different time points. Additionally, multivariate logistic regression analysis revealed that sarcopenia ($OR = 2.88$, $95\%CI: 1.32-6.29$, $P = 0.008$) increased the risk of cardiovascular events by approximately 2.8 times, while sarcopenia ($OR = 3.22$, $95\%CI: 1.11-9.31$, $P = 0.031$) and disturbed CM ($OR = 3.22$, $95\%CI: 1.11-9.31$, $P = 0.031$) increased the risk of fractures by about 3 times. Supplementation with L-carnitine significantly reduces the risk of fractures ($OR = 0.75$, $95\%CI: 0.62-0.91$, $P = 0.003$).

Conclusion: This study found that serum carnitine levels are closely related to sarcopenia in HD patients, and disturbed CM significantly increases the risk of sarcopenia and adverse events. L-carnitine supplementation not only improves carnitine levels but also reduces the risk of adverse events, providing new insights for the prevention and treatment of sarcopenia in HD patients.

Keywords : Serum Carnitine, Sarcopenia, Hemodialysis, L-carnitine

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0115

Abstract Submission No. : APCN20250854

Quantifying Anemia-Related Disability in Chronic Kidney Disease Due to Hypertension and Type 2 Diabetes: A Population-Based Study in Indonesia

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Abstract

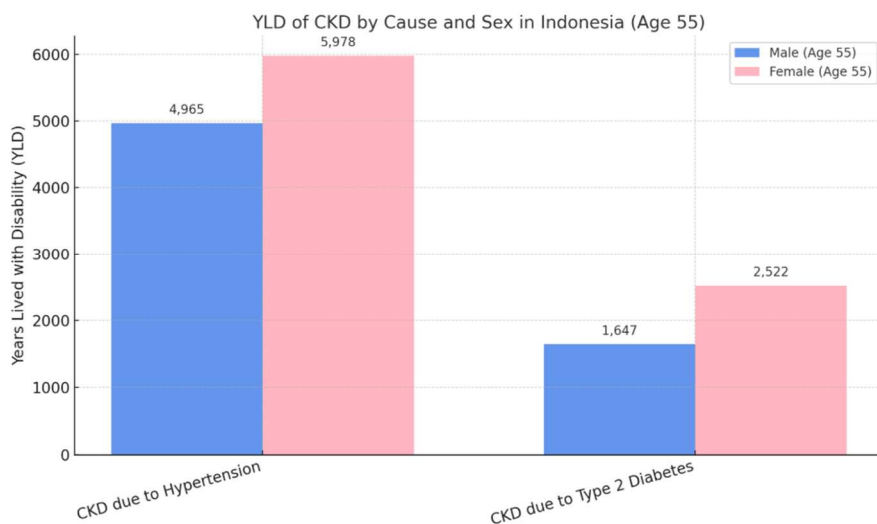
Background: Anemia is the most common complication caused by chronic kidney disease. It is independently associated with risk of death because it affects patient quality of life and clinical outcomes. Anemia still remains a serious clinical challenge in patients with CKD. This study aims to analyze the epidemiological data of anemia as a complication of CKD caused by hypertension and diabetes mellitus type 2.

Methods: This study used data from the Global Burden of Disease database, 2021. The inclusion criteria for the patients are being older than 55 years and being diagnosed with anemia-related chronic kidney disease caused by hypertension or diabetes mellitus type 2. We divided the subjects into two groups: group A, which had anemia-related chronic kidney disease (CKD) due to diabetes mellitus type 2, and group B, which had anemia-related CKD due to hypertension. The analyzed epidemiological data included prevalence and years lived with disability (YLDs). YLDs are defined as years lived with any short-term or long-term health loss that is measured by taking the prevalence of the condition multiplied by the disability weight for the condition.

Results: The prevalence of anemia was higher in group A than in group B (357,074 cases vs. 195,744 cases). The data showed that in both groups A and B, the male percentage was higher than the female percentage, even though the gap was not so far (group A 53.43% and group B 55.40%). YLDs in group A were 10,943 years, while in group B, they were 4,169 years. It means CKD due to hypertension contributed more significantly to YLD than CKD due to DM type 2 in both sexes. Besides that, the YLDs of female patients in both groups A and B were higher than those of males (group A: 5,978 years and group B: 2,522 years). This indicates a greater anemia-related disability burden among women.

Conclusion: Despite a higher prevalence of anemia-related CKD due to type 2 DM compared to hypertension-related CKD, the YLD burden was greater in the hypertensive CKD.

Keywords : Anemia, Chronic Kidney Disease, YLDs, Prevalence



Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0116

Abstract Submission No. : APCN20250957

Establishing the First Kidney Stone Prevention Clinic in Singapore: Outcomes and Lessons Learned

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Abstract

Background: Kidney stone disease (KSD) is a rising cause of morbidity worldwide, associated with pain, renal impairment, and high recurrence rates. Evidence suggests targeted metabolic evaluation and prevention strategies can significantly reduce recurrence, yet such services remain limited in many regions, including Singapore.

Methods: We pioneered the establishment of a multidisciplinary kidney stone prevention clinic at a tertiary center in January 2017, uniting nephrologists, dietitians, urologists and laboratory specialists. We developed an in-house urine metabolic assay in a single 24-hour urine collection for better compliance. 24-hour urine calcium, oxalate, phosphate, uric acid, sodium, urea, citrate, potassium, magnesium and pH values, stone analysis by semiquantitative spectroscopy and stone saturation prediction modelling were translated into personalized dietary and pharmacological interventions. Patients received tailored advice to correct metabolic derangements driving stone formation.

Results: Between January 2017 and June 2025, 308 unique patients attended over 2000 clinic visits. The majority were recurrent calcium stone formers, 7 had primary hyperparathyroidism, 23 had nephrocalcinosis, and one patient had cystinuria. Stone progression was assessed by periodic imaging for new stone formation or growth of existing stones, and follow-up for improvement in metabolic urine parameters associated with kidney stone formation. Among 123 patients with at least two years of follow-up data, 98 (80%) demonstrated no evidence of stone progression, correlating with improvements in key urinary risk factors. These findings suggest a substantial reduction in kidney stone burden among motivated patients engaged in prevention strategies.

Conclusions: Our experience highlights the feasibility and clinical impact of a multidisciplinary kidney stone prevention clinic in Singapore. By integrating in-house metabolic urine testing with individualized interventions, we achieved a high rate of stable disease in patients with significant prior stone burden. This proactive approach can reduce stone-related morbidity and healthcare utilization. Further characterization of the epidemiology and novel risk factors for KSD in Singapore's diverse population will inform broader prevention efforts. Our results support expansion of dedicated stone prevention services and underscore the importance of patient education and long-term follow-up to achieve sustained benefits in stone management.

Keywords : Kidney stones

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0117

Abstract Submission No. : APCN20250967

Exploring the Influence of Malnutrition-Inflammation and Mineral Bone Biomarkers on Hip Fracture Risk Among Dialysis Patients: A Retrospective Observational Study

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Abstract

Objective: Hip fractures in patients undergoing dialysis are associated with increased morbidity, mortality, and healthcare costs. A key contributor to this elevated fracture risk is chronic kidney disease–mineral and bone disorder (CKD-MBD), which is further influenced by the interconnected roles of malnutrition, systemic inflammation, and metabolic derangements. In particular, parathyroid hormone (PTH), as a core biomarker of mineral metabolism, may reflect these complex interactions. This study aimed to evaluate the association between malnutrition-inflammation and mineral bone biomarkers with the risk of hip fracture in patients receiving maintenance dialysis. **Methods:** We performed a retrospective cohort study using the Taipei Medical University Clinical Research Database (TMUCRD) from January 1, 2008, to December 31, 2022. Adult patients (aged ≥ 18 years) with a diagnosis of chronic kidney disease (CKD) who initiated maintenance dialysis were eligible. The index date was defined as the initiation of dialysis. Patients were excluded if they had a history of fracture, less than 90 days of follow-up, or missing baseline PTH data. Participants were stratified into three groups based on initial PTH levels: low (<150 pg/mL), intermediate (150–599 pg/mL), and high (≥ 600 pg/mL). Baseline comorbidities, medications, and laboratory parameters related to nutrition and inflammation were collected within 360 days prior to the index date. The primary endpoint was the occurrence of hip fracture, assessed using Kaplan-Meier survival analysis and Cox proportional hazards models. **Results:** Of 11,325 patients screened, 1,344 met inclusion criteria: 424 in the low PTH group, 748 in the intermediate group, and 172 in the high

group. The mean age was 65.7 years (SD 14), and 57.3% were male. Comorbidities including cardiovascular disease, chronic obstructive pulmonary disease, and diabetes were more prevalent in the low and intermediate PTH groups compared to the high PTH group ($p \leq 0.01$). The Charlson Comorbidity Index was significantly higher in the lower PTH groups ($p = 0.005$). Although the intermediate PTH group had a numerically lower hip fracture risk, differences were not statistically significant (log-rank $p = 0.419$). **Conclusion** Our findings highlights the complex relationship between mineral metabolism, systemic inflammation, and skeletal health in dialysis patients. Both low and high PTH levels may reflect underlying malnutrition-inflammation syndromes associated with increased fracture risk. A multidisciplinary approach is warranted to mitigate fracture risk and optimize bone health in this vulnerable population.

Keywords : CKD-MBD, dialysis, parathyroid hormone, malnutrition, inflammation, hip fracture

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0118

Abstract Submission No. : APCN20251036

Comparative Effectiveness of Hypoxia-Inducible Factor Prolyl Hydroxylase Inhibitors Versus Erythropoiesis-Stimulating Agents on Prognosis in Non-Dialysis Chronic Kidney Disease: A Propensity-Matched Cohort Study

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Abstract

Background:

Renal anemia is commonly treated with erythropoiesis-stimulating agents (ESAs), but these are associated with cardiovascular risks and variable treatment responses. Hypoxia-inducible factor prolyl hydroxylase inhibitors (HIF-PHIs) have emerged as a novel alternative with potential additional benefits.

Methods:

We conducted a retrospective cohort study using the TriNetX platform to compare clinical outcomes between HIF-PHI and ESA users in stage IV chronic kidney disease (CKD) patients not receiving dialysis (GFR 15–30 mL/min/1.73 m²). After 1:1 propensity score matching of 493 pairs, patients were followed for up to three years. The primary outcome was all-cause mortality; secondary outcomes included cardiovascular events and infectious complications.

Results:

HIF-PHI users showed significantly lower all-cause mortality (HR 0.39, 95% CI 0.26–0.58, $p < 0.0001$) and reduced sepsis risk (HR 0.32, 95% CI 0.14–0.74, $p = 0.01$) compared to ESA users. Subgroup analyses confirmed mortality benefits across multiple comorbidities. Ferritin-stratified analyses revealed that HIF-PHI users with ferritin 100-299 ng/mL had the greatest reduction in mortality and sepsis risk.

Conclusions:

In stage IV non-dialysis CKD patients, HIF-PHI therapy was associated with improved survival and reduced infectious complications compared to ESAs, particularly in those with lower ferritin levels.

Keywords : Chronic Kidney Disease, Renal Anemia, Hypoxia-Inducible Factor Prolyl Hydroxylase Inhibitors, Erythropoiesis-Stimulating Agents, Sepsis

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0119

Abstract Submission No. : APCN20251121

From Assessment to Intervention: Improved Nutritional Status in Vietnamese Kidney Transplant Recipients Through Targeted Dietary Counselling

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Abstract

This study evaluated the impact of individualised dietary counselling (IDC) on the nutritional status of kidney transplant recipients (KTRs) in Vietnam.

Method: Conducted between 2021 and 2024 at the 108MCH, this study followed a three-phase design based on the evidence-based programme planning model. Adults aged 18 to 65 years were recruited for the study. Phase I was a 12-month longitudinal study monitoring nutritional and metabolic changes post-transplantation. Phase II involved the development and validation of a culturally adapted nutrition handbook for KTRs. Phase III was a six-month quasi-experimental study involving 97 participants, who were randomly assigned to either the intervention group or the control group to assess the impact of IDC on nutritional status, using the handbook as the intervention material.

Results: In Phase I, among 106 KTRs, the prevalence of malnutrition declined significantly from 46.6% at baseline to 20.9% at 12 months ($p < 0.05$). Metabolic syndrome peaked at 59.3% at three months post-transplant and decreased to 46.5% at 12 months. Significant improvements were observed in blood pressure, triglyceride, and cholesterol levels. Univariate analysis identified nutritional status and metabolic syndrome as risk factors for IKF at 12 months. Findings from Phase I served as the basis for developing a nutrition handbook, which provided guidance on dietary intake for KTRs in Phase II. The Nutrition and Kidney Transplantation Handbook was standardised and validated as an accurate, user-friendly resource for nutritional intervention in Phase III. In Phase III, 97 KTRs were randomised to either the intervention group (IG, $n = 50$) or the control group (CG, $n = 47$). After six months, body weight decreased in the IG (-1.8 kg) and increased in the CG (+1.5 kg), though the difference was not statistically significant ($\eta^2 < 0.01$). The IG maintained adequate energy (mean \pm standard deviation: 30.6 ± 10.4 kcal/kg) and protein intake (1.3 ± 0.4 g/kg) after the intervention. Compared to the control group, dietary intake was moderately affected by the intervention in KTRs ($\eta^2 > 0.06$, $p < 0.05$). The six-month intervention had a small effect on reducing the prevalence of metabolic syndrome ($\eta^2 < 0.06$).

Conclusion: Nutritional status significantly improved within the first year post-transplantation. IDC, supported by a tailored handbook, had a moderate effect on dietary behaviours and a small impact on metabolic outcomes. A structured nutrition management programme incorporating IDC should be integrated into routine post-transplant care to support long-term health and quality of life.

Keywords : Individualised dietary counselling; Kidney transplant recipients; Nutritional status.

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0120

Abstract Submission No. : APCN20251147

Vascular Endothelial Growth Factor as a Biomarker of Early Kidney Microangiopathy in Obese Adolescents with Type 1 Diabetic Nephropathy

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Abstract

Background

Diabetic nephropathy is a leading cause of chronic kidney disease, often progressing due to microvascular damage. Vascular Endothelial Growth Factor (VEGF) plays a crucial role in renal vasculature by regulating endothelial function, while elevated pro-inflammatory markers such as procalcitonin and C-reactive protein (CRP) have been associated with kidney dysfunction. However, the impact of obesity on VEGF-related renal changes remains unclear.

Aim

This study evaluates VEGF, procalcitonin, and CRP as potential biomarkers of early kidney microangiopathy in obese adolescents with and without type 1 diabetic nephropathy.

Methods

A total of 270 adolescents were included: 110 with type 1 diabetic nephropathy, 80 obese without diabetes, and 80 healthy controls. Serum VEGF, procalcitonin, and CRP levels were measured using ELISA, along with assessments of renal function markers such as serum creatinine, estimated glomerular filtration rate (eGFR), and urinary albumin-to-creatinine ratio (UACR). The association between these biomarkers and kidney function was analyzed in relation to body mass index (BMI) and insulin resistance (HOMA-IR).

Results

Obese adolescents exhibited the highest VEGF levels (366.55 ± 171.44 pg/ml), followed by those with type 1 diabetic nephropathy (259.88 ± 169.89 pg/ml), while healthy controls had the lowest levels (185.75 ± 143.88 pg/ml). Procalcitonin and CRP levels were significantly elevated in adolescents with early signs of kidney dysfunction, correlating positively with BMI, HOMA-IR, and UACR, but not with cholesterol or triglycerides. Statistically significant differences in VEGF levels between the groups suggest its role in kidney microangiopathy.

Conclusion

Elevated VEGF, procalcitonin, and CRP levels are potential biomarkers of early renal microvascular damage, particularly in obese adolescents. The stronger correlation of these markers with obesity than with type 1 diabetic nephropathy highlights obesity's role in accelerating kidney dysfunction. These findings emphasize the need for early monitoring of VEGF and inflammatory markers to prevent progression to chronic kidney disease in at-risk adolescents.

Keywords : Diabetic nephropathy, Vascular Endothelial Growth Factor , kidney dysfunction, obese adolescents

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0121

Abstract Submission No. : APCN20251215

Parathyroidectomy Alters Fat Browning, Lean Mass, and Bone Health in Dialysis Patients with Secondary Hyperparathyroidism

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Abstract

Background:

Secondary hyperparathyroidism (SHPT) in dialysis patients is associated with elevated parathyroid hormone (PTH) levels that may influence lipid metabolism and adipose tissue remodeling. The effects of parathyroidectomy (PTX) on fat distribution and cardiometabolic markers remain unclear.

Methods:

We conducted a prospective study of 25 dialysis patients with SHPT who underwent PTX and SHPT controls without surgery. Assessments included serum biochemistry, body composition (lean/fat mass, basal metabolic rate), epicardial adipose tissue (EAT) volume and attenuation (EATat), and bone mineral density (BMD) at the lumbar spine and femoral neck. All measurements were taken at baseline and at 6 months.

Results:

In the PTX group, fat mass increased significantly ($29.8 \pm 8.8\%$ to $32.3 \pm 9.2\%$; $P < 0.01$), lean mass decreased ($65.4 \pm 8.9\%$ to $63.2 \pm 8.7\%$; $P < 0.01$), and basal metabolic rate declined (1316.2 ± 171.4 to 1279.1 ± 161.5 kcal/day; $P < 0.01$). EAT volume increased (116.0 ± 50.8 to 125.8 ± 56.6 mL; $P = 0.04$), while EATat decreased (-72.4 ± 7.4 to -74.2 ± 6.6 HU; $P = 0.04$), indicating reduced fat browning and a shift toward more metabolically inactive but less inflammatory adipose tissue. BMD increased significantly at the spine ($9.6 \pm 6.0\%$) and femoral neck ($13.8 \pm 12.7\%$; both $P < 0.01$). No significant changes were observed in the control group, except for a small reduction in EAT volume ($P = 0.04$).

Conclusion:

Parathyroidectomy alters fat distribution and reduces fat browning in dialysis patients with SHPT. Despite a reduction in lean mass, PTX improves bone mineral density and may offer cardiometabolic benefits.

Keywords : parathyroidectomy; secondary hyperparathyroidism; epicardial adipose tissue ;basal metabolic rate

Poster Presentation : Anemia, CKD-MBD, Nutrition, and Metabolism

Poster No. : C0122

Abstract Submission No. : APCN20251246

Effect of nutritional intervention combined with exercise therapy on patients with sarcopenia in maintenance hemodialysis

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Abstract

Background: Sarcopenia, characterized by the progressive loss of muscle mass, strength, and function, is prevalent among patients undergoing dialysis for end-stage kidney disease (ESKD). This condition is associated with increased mortality, cardiovascular events, and functional decline. Despite its significance, sarcopenia remains under-recognized and under-managed in clinical settings. Interventions combining nutritional support and physical therapy have shown promise in addressing sarcopenia. However, comprehensive studies evaluating their combined effects over extended periods are limited in Mongolia. Hemodialysis treatment in combination with physical therapy and improving nutritional status is a fundamental component for longtime effective patient support.

Methods: This prospective cohort study involved 215 patients on Maintenance hemodialysis who follow-uped at Medvic hemodialysis center design to assess the impact of a 4-month intervention combining tailored nutritional support and structured physical therapy on sarcopenia. Participants were recruited from a single-center dialysis unit and underwent baseline and follow-up assessments. Nutritional interventions included individualized dietary counseling and supplementation aimed at enhancing protein intake and correcting deficiencies. The physical therapy regimen comprised resistance and aerobic exercises tailored to each patient's capabilities. Outcomes were measured using standardized tools: skeletal muscle mass was assessed via bioelectrical impedance analysis, muscle strength through handgrip dynamometry, and physical performance using the 6 meter walk speed. Sarcopenia was assessed using the 2019 criteria from the Asian Working Group for Sarcopenia (AWGS).

Results: Of the study participants 8.7% diagnosed sarcopenia. Post-intervention, there was a significant improvement in muscle strength (mean increase of 15%, $p < 0.01$) and physical performance ($p < 0.05$). Muscle mass showed a modest but significant increase (mean increase of 5%, $p < 0.05$). Within the patient's with sarcopenia group, physical activity and BMI significantly correlated with the condition's severity.

Conclusion: A 4-month combined intervention of nutritional support and physical therapy significantly improved muscle strength, physical performance, and muscle mass in dialysis patients with sarcopenia. These findings underscore the importance of early identification and multidisciplinary management of sarcopenia in this population. Further large-scale, randomized controlled trials are warranted to confirm these results and establish standardized intervention protocols.

Keywords : sarcopenia, nutritional support