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Feasibility of a Dietary Inflammatory Index guided Anti-Inflammatory Diet in Indian Predialysis CKD: Biomarker and Functional changes

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Objectives : Chronic kidney disease (CKD) affects ~850 million people globally and ~17% of Indian adults, with chronic low-grade inflammation driving progression and cardiovascular risk. Higher Dietary Inflammatory Index (DII) scores, reflecting pro-inflammatory diets, are associated with greater CKD prevalence and lower eGFR in observational cohorts. In our previous cross-sectional cohort, each one-unit higher DII corresponded to a 2.85 mL/min/1.73 m² lower eGFR. Thus, this pilot study evaluated the feasibility, safety, and biomarker changes accompanying a culturally tailored anti-inflammatory dietary pattern in predialysis CKD patients.

Methods : Single-arm, 8-week feasibility study of adults with CKD stages 2–5 following a dietary pattern structured around eight anti-inflammatory, CKD-appropriate ingredients (millets, barley, soy, flaxseed, turmeric, ginger, black pepper, green tea). Dietary intake assessed via 4-5 24-hour recalls per timepoint; DII computed from 45 nutrients/food components using a standardised algorithm. Body composition (InBody 770), five-times sit-to-stand, handgrip strength, and IPAQ-SF, alongside fasting kidney function tests, protein fractions, electrolytes, minerals, lipid profile, hs-CRP, malondialdehyde (TBARS), and antioxidant capacity (FRAP, FRAP-UA) were measured; eGFR was estimated with CKD-EPI 2009.

Results : 80% completed the study (n=16), with no withdrawals after week two. DII improved from -2.07 to -4.35 (Δ -2.28, $p < 0.001$); dietary diversity and soluble fibre increased; omega-6:omega-3 ratio shifted from 36.2 to 3.56 ($p < 0.001$). eGFR remained stable, hs-CRP declined non-significantly, malondialdehyde decreased, and FRAP-UA increased (favourable oxidative profile). Skeletal muscle mass and handgrip strength increased modestly, physical activity (MET-minutes) rose, albumin maintained, phosphorus decreased, potassium remained within limits, lipid profile showed no clear adverse pattern, supporting safety over the study period.

Conclusions : A culturally tailored anti-inflammatory (low-DII), CKD-adapted dietary pattern in Indian predialysis CKD was feasible and well tolerated and was accompanied by favourable dietary, biochemical, and functional changes with short-term renal stability, supporting further evaluation in randomised trials.

Table 1_Dietary profile.jpg



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Table 1: Key dietary changes post intervention

Variables	Pre-intervention (n=16)	Post-intervention (n=16)	Δ Post-Pre	p-value
Mean ± SD				
DII	-2.066 ± 0.683	-4.350 ± 0.666	2.284 ± 0.925	0.000**
DDS	5.31 ± 0.87	6.25 ± 0.93	0.94 ± 1.18	0.006**
Soluble fiber (g/d)	6.42 ± 1.77	10.06 ± 1.08	3.64 ± 1.28	0.000**
ω6:ω3	36.23 ± 24.54	3.56 ± 0.82	-32.68 ± 24.9	0.000**

*Significant at p<0.05, **Significant at p<0.01
DII: dietary inflammatory index, DDS: Dietary diversity score

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Table 2: Primary biomarker changes post intervention

Parameters	Pre-intervention (n=16)	Post-intervention (n=16)	Δ Post-Pre	p-value
	Mean ± SD			
Creatinine (mg/dL)	2.27 ± 0.88	2.26 ± 0.85	-0.01 ± 0.3	0.982
eGFR(mL/min/m ²)	37.81 ± 21	37.63 ± 21.28	-0.19 ± 7.1	0.895
hs-CRP (mg/dL)	0.373 ± 0.31	0.24 ± 0.19	-0.138 ± 0.29	0.075
MDA (μmol/L)	4.35 ± 1.87	2.60 ± 1.49	- 1.75 ± 2.12	0.005**
FRAP_UA (μmol/L)	127.92 ± 20.68	151.95 ± 32.38	24.02 ± 30.75	0.007**

*Significant at p<0.05, **Significant at p<0.01

eGFR: estimated glomerular filtration rate, hs-CRP: high-sensitivity C-reactive protein, MDA: malondialdehyde, FRAP_UA: uric-acid independent ferric reducing antioxidant power