VEGETARIAN VERY LOW PROTEIN DIET SUPPLEMENTED WITH KETOANALOGUES MAY REDUCE NEPHROTIC-RANGE PROTEINURIA IN PREDIALYSIS CKD PATIENTS

Liliana Gârneaţă[1,2], Alexandra Stancu[2], Paula Luca[2], Gabriel Ştefan[1], Gabriel Mircescu[1,2]

[1] - "Carol Davila" University of Medicine and Pharmacy, Bucharest; [2] - "Dr Carol Davila" Teaching Hospital of Nephrology, Bucharest, Romania

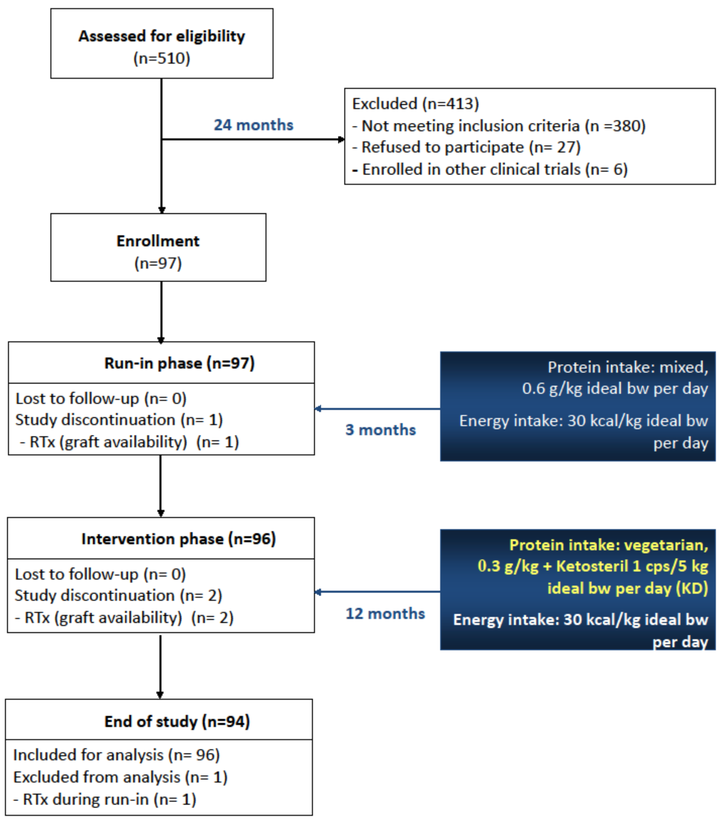
BACKGROUND AND OBJECTIVE

- **Background**: Protein-restricted diets were reported as beneficial in advanced Chronic Kidney Disease (CKD) to postpone dialysis, mainly through a better metabolic control [1-7]. Better blood pressure control and decrease in proteinuria with low protein diets were also supported [8-10].
- **Objective**: to to assess the impact of ketoanalogue-supplemented vegetarian very low protein diet (keto-diet, KD) on nephrotic-range proteinuria in CKD patients.

STUDY DESIGN. SUBJECTS AND METHODS

- **Type**: Prospective, interventional, single-center
- **Parameters**:
  - Efficacy:
    - Primary:
      - Proteinuria
      - GFR
      - Death of the patient/ESRD
    - Secondary : CKD-related metabolic disturbances
  - Safety: nutritional status, dietary compliance, adverse events

- **Selection criteria**:
  - non-diabetic adults, stage 4 CKD (GFR 15-30 mL/min per 1.73m2, average of urea and creatinine clearances)
  - proteinuria >3 g/g creatininuria
  - primary glomerulopathies
  - without indication/with contraindications for ethiologic/pathogenic treatment
  - good nutritional status



Patients Flowchart

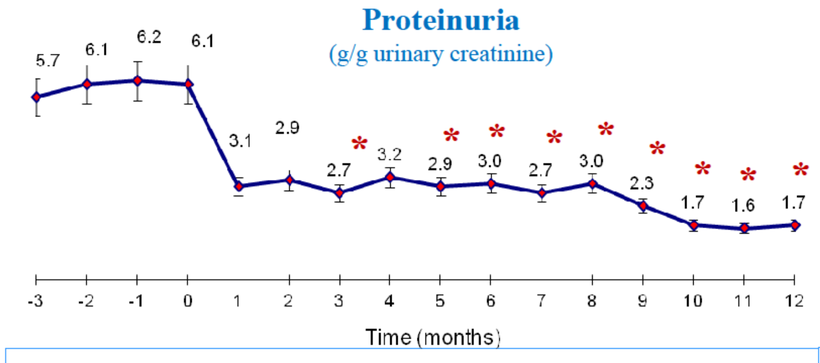
Patients' characteristics

Age (years)#	55.0±11.3
Gender (male, %)	63
Parameters of renal function	
Proteinuria (g/g creatininurie)	5.7±2.1
GFR (mL/min/1.73 m²) #	27.9±5.8
Estimated rate of GFR decline (mL/min-yr)	7.5 (5.9-8.2)
Serum creatinine (mg/dL)	2.4±1.1
Blood pressure control	
Patients with optimal BP control (%)##	71.7
Patients on antihypertensive treatment (%)	92
Patients on ACEIs/ARBs (%)	100
Parameters of nutritional status	
SGA (A, %)	87
Body mass index (BMI) (kg/m²) #	24.9±4.2
Serum albumin (g/dL) #	3.7±0.3
Parameters of inflammation	
C - reactive protein (CRP, mg/L)*	4.0 (2.0; 8.0)
Dietary habits prior to enrollment	
Protein intake (g/day)	0.75±0.22
Energy intake (kcal/day)	33.2±3.1

RESULTS

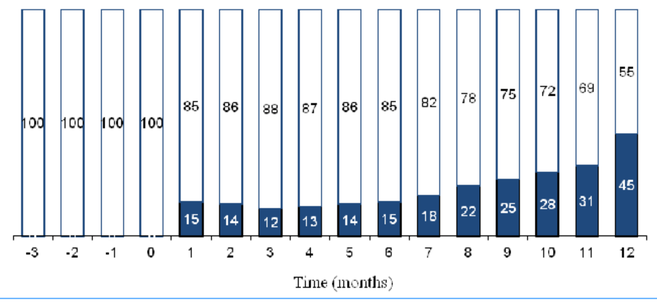
Proteinuria. Progression of Chronic Kidney Disease

Proteinuria
(g/g urinary creatinine)



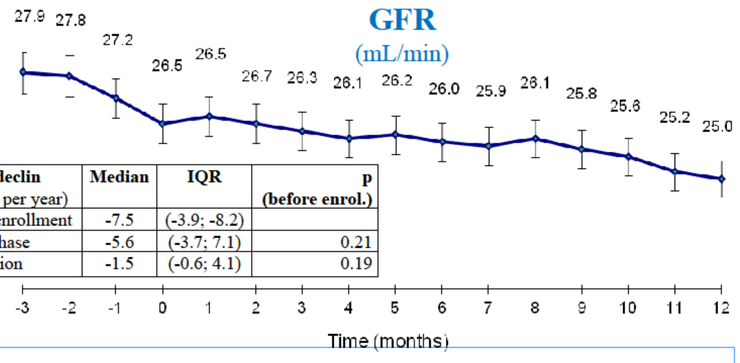
- Proteinuria did not significantly change during run-in, but significantly decreased starting with the 3rd month of KD (*- p<0.05).

% Patients with proteinuria < 1 g/g



- No patient had protenuria<1 g/g at baseline. 12% of patients reached this level ("**responders**") after 3 mo of KD; 45% were "**responders**" at EOS.

GFR
(mL/min)

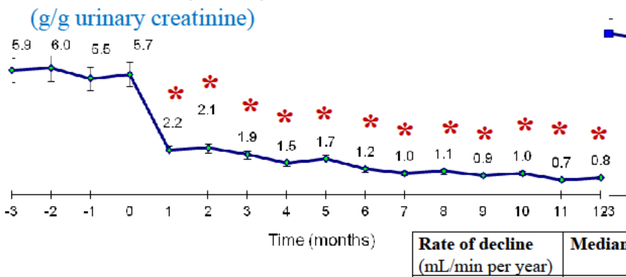


Rate of declin (mL/min per year)	Median	IQR	p (before enrol.)
Prior to enrollment	-7.5	(-3.9; -8.2)	
Run-in phase	-5.6	(-3.7; 7.1)	0.21
Intervention	-1.5	(-0.6; 4.1)	0.19

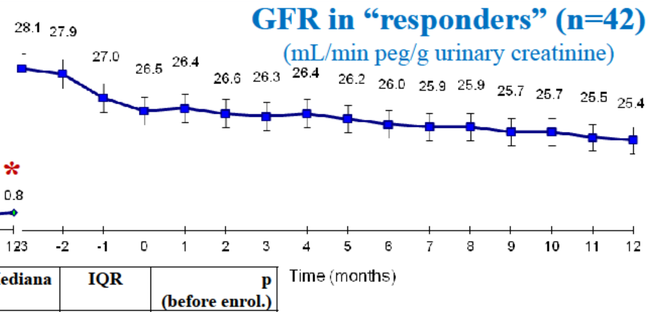
- GFR continued to decrease.
- The rate of decline was reduced, with no statistical significance

Proteinuria and Progression of CKD in "responders"

Proteinuria (n=42)
(g/g urinary creatinine)



GFR in "responders" (n=42)
(mL/min peg/g urinary creatinine)

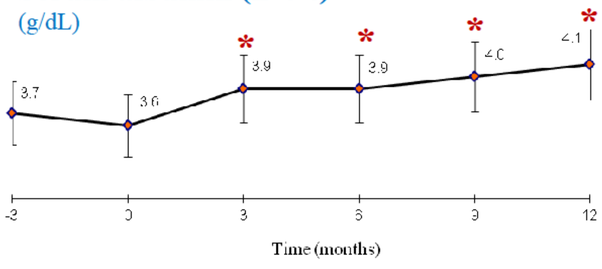


Rate of decline (mL/min per year)	Mediana	IQR	p (before enrol.)
Before enrollemnt	-7.8	(-4.1;-8.8)	
Run-in phase	-6.4	(-4.5;-7.4)	0.41
Intervention	**-1.1**	**(-0.4;-3.7)**	**0.05**

- In "responders", the rate of decline in renal function significantly decreased.
- There were no differences between "responders" and "non-responders"at baseline in age, gender, proteinuria, GFR, previous rate of decline, nutritional status, BP control, use of ACEI/ARBs or previous dietary habits.

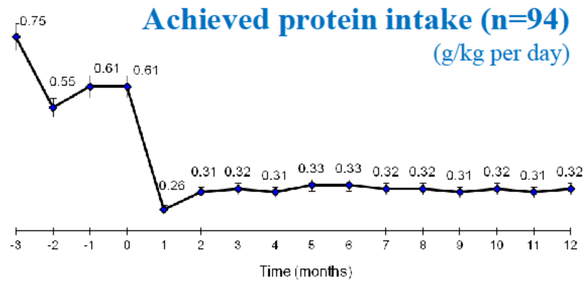
Safety Parameters. Compliance

Serum albumin (n=94)
(g/dL)



- Serum albumin significantly increased starting with the 3rd month of KD.

Achieved protein intake (n=94)
(g/kg per day)



- The protein intake was very close to prescription throught the study.

- The compliance to KD was good.
- There were no changes in the nutritional status and no adverse reactions.

CONCLUSIONS

- In compliant CKD patients with nephrotic-range proteinuria and no indication for specific therapies, vegetarian very low protein diet supplemented with ketoanalogues could reduce proteinuria and even the rate of decline in renal function in "responders", without any negative influence on the nutritional status,.

REFERENCES

1. Mitch WE: Dietary protein restriction in chronic renal failure: nutritional efficacy, compliance, and progression of renal insufficiency. J Am Soc Nephrol 2:823-831, 1991
2. Walser M, Hill S: Can Renal Replacement Be Deferred by a Supplemented Very Low Protein Diet? J Am Soc Nephrol 10:110–116, 1999
3. Fouque D et al: Low protein diets for CKDin non diabetic adults. Cochrane Database Syst Rev3:CD001892, 2009
4. Mircescu G et al: Effects of a supplemented hypoproteic diet in CKD. J Ren Nutr 17(3):179-188, 2007
5. Brunori G et al: Efficacy and Safety of a Very-Low-Protein Diet When Postponing Dialysis in the Elderly: A Prospective Randomized Multicenter Controlled Study, Am J Kidney Dis,49(5) 569-580, 2007
6. Piccoli GB et al: Vegetarian low-protein diets supplemented with ketoanalogues: a niche for the few or an option for many? Nephrol Dial Transplant 28:2295–2305, 2013
7. Garneata L et al: Ketoanalogue-Supplemented Vegetarian Very Low–Protein Diet and CKD Progression, J Am Soc Nephrol, Published online before print January 28, 2016
8. Teplan et al. Effects of very low protein diet supplemented with ketoanalogues on proteinuria in diabetic atients. Klin Biochem Met 2:70-73, 2003
9. Bellizzi V et al. Very low protein diet supplemented with ketoanalogs improves blood pressure control in chronic kidney disease, Kidney Int, 2007; 71: 245–251
10. Di Iorio et al: Phosphate attenuates the anti-proteinuric effect of very low-protein diet in CKD patients, Nephrol Dial Transplant, 2013;28:632-640

53 ERA
334--SP
Chronic Kidney Disease. Nutrition, inflammation and oxidative stress.
Liliana Garneata
DOI: 10.3252/pso.eu.53era.2016
ePosters supported by F. Hoffmann- La Roche Ltd.
53rd CONGRESS ERA-EDTA VIENNA AUSTRIA MAY 21st-24th, 2016
PosterSessionOnline.com