

# In center meals in hemodialysis patients: effects of protein rich and high caloric options

Ana Valente<sup>1</sup>, Cristina Garagarza<sup>1</sup>, Cristina Caetano<sup>1</sup>, Telma Oliveira<sup>1</sup>, Sandra Ribeiro<sup>1</sup>  
<sup>1</sup> Nephrocare, Lisbon, Portugal.  
 Ana Valente: [anatenugalvalente@gmail.com](mailto:anatenugalvalente@gmail.com)

## Introduction and objective

Patients in hemodialysis (HD) have higher caloric and protein needs due to several factors related with the kidney disease.

The aim of this study was to evaluate the effect of an intradialytic oral nutrition hypercaloric and hyperproteic meal in HD patients.

## Methods

- 3-month multicenter intervention study with 588 patients in HD at least for 3 months.
- A meal was given during each HD treatment.
- There were 3 different groups of patients:
  - ✓ **Control group** (n=249) – free meal brought from patient’s home;
  - ✓ **Group 1** (n=169) – high protein content meal;
  - ✓ **Group 2** (n=170) – high caloric-moderate protein content meal.



- Clinical, body composition parameters and hand grip strength were measured at baseline and at the end of the study.
- Body composition was assessed with bioimpedance spectroscopy (Body Composition Monitor®).
- A p-value <0.05 was considered statistically significant.

## Results

**Table 1. Patient’s characteristics**

	Control Group	Group 1	Group 2
N	249	169	170
Age (years)	67.9±14.8	62.4±15.9	66.6±15.4
Gender (male)	51.4%	64.5%	54.1%
HD vintage (months)	65.4±58.5	72.4±58.7	51.7±44.7
Diabetes (yes)	24.9%	29.6%	34.1%

Values presented as Mean ± SD  
 HD - hemodialysis

**Table 2. Comparison of all subjects at baseline and at the end of the study.**

Variable	Control Group (n=249)			Group 1 (n=169)			Group 2 (n=170)		
	Baseline	End	p-value	Baseline	End	p-value	Baseline	End	p-value
Serum albumin (g/dl)	3.9±0.4	3.9±0.3	<0.001*	4.0±0.3	4.0±0.3	0.042*	3.9±0.4	3.9±0.4	0.149
Hemoglobin (g/dl)	11.1±1.0	11.1±1	0.503	11.2±1.3	11.4±1.3	0.230	10.7±1.2	11.2±1.1	<0.001*
Phosphorus (mg/dl)	4.3±1.2	4.3±1.3	0.979	4.6±1.3	4.6±1.4	0.955	3.6±1.1	3.9±1.3	<0.001*
Calcium (mg/dl)	8.9±0.7	9.0±0.7	0.994	8.9±0.7	9.0±0.9	0.021*	8.8±0.7	8.9±0.8	0.003*
nPCR (g/kg/day)	1.1±0.2	1.1±0.2	0.651	1.1±0.2	1.1±0.2	0.193	1.1±0.3	1.1±0.2	0.013*
Potassium (mEq/l)	5.3±0.8	5.2±0.8	0.058	5.2±0.7	5.3±0.9	0.561	5.1±0.7	5.2±0.8	0.013*
Systolic Blood Pressure (mmHg)	141.3±24.0	137.6±23.5	<0.001*	142.8±21.2	141.4±23.9	0.400	141.9±22.1	134.1±21	<0.001*
Diastolic Blood Pressure (mmHg)	66.9±14.4	65.1±14.5	0.017*	69.2±14.9	67.6±15.4	0.095	65.4±14.1	62.6±14.2	0.009*
Dry weight (kg)	67.3±13.7	66.9±13.6	0.006*	67.8±14.8	67.4±14.8	0.012*	68.1±12.9	67.5±12.7	0.007*
BMI (kg/m <sup>2</sup> )	26.2±5.0	26.0±5.0	0.001*	25.6±5.0	25.3±5.0	0.002*	26.2±4.8	26.0±4.7	0.011*
OH/ECW pre dialysis (%)	9.1±8.2	8.0±9.5	0.061	10.2±8.6	10.1±9.2	0.849	10.0±10.3	9.3±9.2	0.453
LTI (kg/m <sup>2</sup> )	12.2±2.9	12.4±2.8	0.284	13.4±3.1	13.3±3.2	0.495	11.8±3.0	12.1±3.3	0.130
FTI (kg/m <sup>2</sup> )	13.2±5.7	13.0±5.5	0.091	11.3±5.8	11.1±5.9	0.450	13.3±5.7	12.9±5.8	0.044
Body cell mass (kg)	17.7±6.5	17.9±6.2	0.324	20.6±7.0	20.4±7.3	0.549	17.1±6.8	17.7±7.0	0.179
HGS <sup>a</sup> (kg)	20.2±9.7	19.8±10.1	0.099	22.6±10.7	25.0±12.2	<0.001*	21.4±11.0	21.4±11.2	0.873

Values presented as Mean ± SD ; \* Significant p values (p <0.05)

nPCR- normalized protein catabolic rate, BMI - body mass index, OH/ECW - Overhydration/ Extracellular water, LTI - lean tissue index, FTI - fat tissue index, HGS - handgrip strength.

## Conclusion

Many of the positive results regarding laboratorial and clinical parameters were observed in the group of patients who ate a high caloric-moderate protein content meal. However, an improvement in muscle strength was only observed in the group with a high protein content meal.

