

# THE EFFECT OF MODERATELY HYPERPROTEIC NUTRITION ON RENAL FUNCTION IN CRITICALLY ILL PATIENTS

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## BACKGROUND & OBJECTIVES

- National and international nutrition guidelines recommend protein intake of at least 1.2 g/kg/day in most critically ill patients. The use of very high protein formulas has been met with concerns of renal toxicity. Thus, we aimed at determining whether hyperproteic nutrition would negatively affect the accumulation of nitrogen byproducts Blood Urea Nitrogen (BUN) and creatinine (Cr).

## METHODS

- A previously described multi-center, prospective randomized open label trial in medically critically ill patients compared the use of a very high protein (37%) low carbohydrate (29%) containing formula (Peptamen® Intense VHP) as part of a hypocaloric protocol (VHPHC) with a high protein (25%) average carbohydrate (45%) containing formula (Replete®) as part of a conventional (normocaloric) protocol (HPNC). BUN/Cr were measured daily. Biochemistry values were analyzed by ANCOVA correcting for baseline and center.

## DEMOGRAPHICS

	High Protein/ Normocaloric (n=53)	Very High Protein/ Hypocaloric (n=52)
Age	63.3 ±11.9	61.0 ±14.6
Gender Female	54.7%	42.3%
BMI	33.0 ± 5.8 kg/m <sup>2</sup>	33.4 ± 4.6kg/m <sup>2</sup>
APACHE II	25.9 ± 9.2	24.8 ± 8.8
<b>Diagnosis:</b>		
Acute Respiratory Failure	18 (34%)	16 (30.8%)
Sepsis	14 (26.4%)	11 (21.2%)
Pneumonia	9 (17%)	9 (17.3%)
Neurological	6 (11.3%)	9 (17.3%)
Cardiac	4 (7.5%)	5 (9.6%)
Pulmonary Embolism	1 (1.9%)	1 (1.9%)
Kidney Injury	1 (1.9%)	0 (0%)
Hemorrhagic Stroke	0 (0%)	1 (1.9%)

- 105 patients were evaluated. BUN/Cr were measured daily in most patients. Protein delivery per group were similar (1.2 vs 1.1 for HPNC and VHPHC respectively). Groups were comparable with respect to age, BMI and sex. Most frequent diagnoses on admission were acute respiratory failure, pneumonia and sepsis. Table 1 depicts BUN/Cr levels per day per group. No statistically significant differences were identified between groups in any of the measures evaluated. While a slight increase in BUN was observed in both groups across time, creatinine levels improved in both groups per day measured.

## RESULTS

Figure 1. Protein Intake by Day

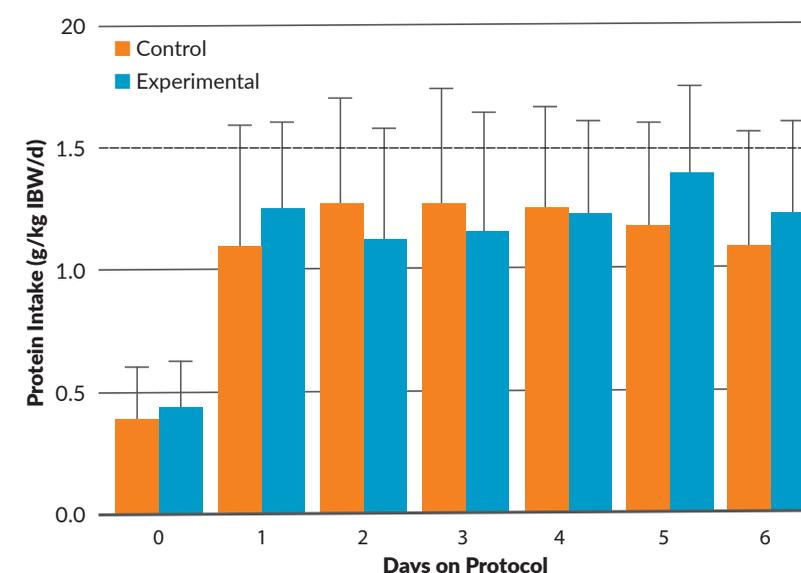


Figure 2: Renal Function Tests by Day

Day	BUN High Protein/ Normocaloric	BUN Very High Protein/ Hypocaloric	Creatinine High Protein/ Normocaloric	Creatinine Very High Protein/ Hypocaloric
1	29 mg/dL	28.4 mg/dL	1.3 mg/dL	1.3 mg/dL
2	30.2 mg/dL	27 mg/dL	1.2 mg/dL	1.3 mg/dL
3	30.2 mg/dL	30.8 mg/dL	1.1 mg/dL	1.1 mg/dL
4	31.1 mg/dL	34.9 mg/dL	1.2 mg/dL	1.1 mg/dL
5	32.7 mg/dL	36 mg/dL	1.1 mg/dL	1.1 mg/dL
6	33.6 mg/dL	37.1 mg/dL	1 mg/dL	1 mg/dL
7	36.6 mg/dL	41.6 mg/dL	1 mg/dL	1.1 mg/dL

## CONCLUSION

The use of a very high protein enteral formula at 1.2 g/kg/day, in line with current critical care guidelines, was not associated with a detrimental effect on renal function and accumulation of nitrogen waste products.



Presented at ASPEN 2019 Nutrition Practice and Science Conference, March 2019, Phoenix, AZ.

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