

# Article Review

## Oral Protein Supplementation Alone Improves Anabolism in a Dose-Dependent Manner in Chronic Hemodialysis Patients.

Sundell MB, Cavanaugh KL, Wu P, Shintani A, Hakim RM, Ikzler TA.

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A positive net protein anabolic effect, reversing protein wasting associated with chronic hemodialysis (HD), was shown in six Vanderbilt HD patients with either 60-mL and 30-mL doses of Pro-Stat\* administered one time in conjunction with HD. The higher dose resulted in a more robust net protein anabolic response both in whole-body and skeletal muscle compartments.

Supplementation with Pro-Stat significantly decreased acute protein breakdown with some concurrent improvement in acute protein synthesis without reported side-effects. This is in contrast to other studies based on combination protein, carbohydrate and fat ("mixed diet") supplementation, which also decreased protein wasting but often with patient intolerance due to symptoms of bloating and diarrhea. The improved tolerance with the use of amino acids alone is thought to be due to significantly lower volume and absence of high carbohydrate and fat content (of common oral supplements). However, authors point out that theirs was a one-time administration and repetitive administrations may lead to some inconvenience.

The primary outcome of this study was NET PROTEIN BALANCE (protein synthesis minus protein breakdown). Both whole-body protein and skeletal muscle turnover were measured, with amino acids grouped into branched chain, essential, non-essential and total for statistical comparisons. Pre-HD, during HD and post-HD periods were also compared.

The three protocols were no supplement (control), two 30-mL doses or two 60-mL doses administered in a random, prospective, crossover design. The first dose was given at the initiation of HD

and the second dose 30 minutes after HD was initiated. The six patients participated in all three protocols with at least 4 weeks between treatments for isotope clearance. Changes in the amino-acid and protein results along with insulin concentration and plasma glucose concentration were compared statistically among protocols.

The control protocol resulted in a substantial release of amino acids from the forearm (catabolic state), which was greatly reduced by both Pro-Stat protocols and was to some extent reversed to a positive state during the 60-mL protocol. Whole-body protein metabolism showed differences during the different time periods and three protocols but a stronger anabolic response for the 60-mL supplementation was observed.

These one-time acute results are interesting and certainly could improve nutritional status of many HD patients if they are shown to be applicable longer term, to larger populations of patients and in patients with co-morbidities such as inflammation, congestive heart failure, coronary artery disease or diabetes mellitus, which are common in the HD population. ♦

\* Pro-Stat (Medical Nutrition USA, Inc, Englewood, NJ) is a high-nitrogen containing, enzyme-hydrolyzed, tryptophan-fortified, collagen protein supplement.

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