

## Effectiveness of protein supplement among patients undergoing Haemodialysis in National Kidney Centre

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**Abstract:** *Background and Objectives:* Protein-energy malnutrition (PEM) is a common problem in dialysis centers and prevalent among dialysis patients. *Methods:* An interventional Study was conducted in the National Kidney Centre, Kathmandu, Nepal, for a period of 1 month. Among patients who were undergoing dialysis, 30 participants were selected randomly. The protein supplement (powder) was provided to the patients for one month after obtaining pre-test and then post-test was done among them to know the changes in the parameters. *Results:* The study revealed various parameters as albumin, urea, phosphorous and calcium to be significantly increased after protein supplementation. *Conclusions:* The protein supplement was found to be effective for haemodialysis patients.

**Keywords:** CKD, Protein supplement, Hemodialysis, Albumin.

### Introduction

Protein-energy malnutrition (PEM) is a common problem and prevalent among dialysis patients [1-4] affecting an estimated 23% to 73% of patients receiving maintenance hemodialysis. PEM has a complex syndrome caused by nutritional and non-nutritional factors such as deficient food ingestion secondary to uremia, dietary restriction, chronic inflammatory state, and increased catabolism related to treatment modalities, nutrients loss in dialysate, and metabolic acidosis [1].

Malnutrition in dialysis patients has consequence as disturbances in protein and energy metabolism, hormonal derangements, infections and other superimposed illnesses, and poor food intake because of anorexia, nausea and vomiting, caused by uraemic toxicity. Inadequate intakes of protein and calories affect nutrition status, and intakes of energy and protein for many dialysis patients are lower than the recommended requirements [5]. Hormonal derangements, comorbidities, inflammation, inadequate dialysis, poor control of acidosis, loss of nutrients in dialysate, and longterm dialysis also may adversely affect appetite and nutritional intake [4].

Nutritional supplements are suggested in such patients to keep their nutritional status appropriate. Therefore, dietary status assessment

is meaningful for those patients at risk with malnutrition. Inadequate dietary nutrients intake is an important cause for malnutrition. As we all know, protein, energy, even vitamins and trace elements intake are inadequate in most hemodialysis patients. And the remarkable reduction of daily nutrients intake has been shown to be an independent determinant of reversible impairment of nutritional status [6].

The National Kidney Center being one of largest dialysis center in Nepal performs hemodialysis service up to 130 sessions per day and has many nutritional challenges. The patients are unaware of nutritional need as well as lack of financial makes them unable to buy nutritious food. Hence, protein energy malnutrition is commonly seen. Hence, this study was carried out to Identify dietary protein supplement could whether overcome the nutritional challenges of haemodialysis and pre-dialysis condition.

### Material and Methods

This is an interventional Study was conducted in the National Kidney Centre, Kathmandu, Nepal, for a period of 1 months. Among patients who were undergoing dialysis, 30 participants were selected randomly.

A total of 30 patients were enrolled in the study. The protein supplement (powder) manufactured by New Bellus Enterprises and distributed by Antah Pharma, Malaysia was provided to the patients for one month after obtaining pretest and then posttest was done among them to know the changes in the parameters. Similarly, the anthropometric measurements and physical examinations were also done both the times for both patients. Also, the predesigned questionnaire was used to assess the qualitative aspects.

All those who were ready to do pre and post biochemical test with their own cost were included in the study and those who were seriously ill and were in last stage were excluded from the study. Ethical clearance was obtained from Research unit of NKC. Written informed consent was taken from both the patients and their visitor in the single paper. Data entry and analysis was made by using Statistical Package for Social Science (SPSS) software (Version 20.0). Appropriate statistics were applied.

### Results

Among 30 patients 10 % of the respondents didn't like the smell and taste of the product as compared to the other nutritional supplement they used. 90% of the respondents accepted the product. Qualitative Analysis showed that patients felt the product tasty, refreshing and good with protein supplement. 7 out of 30 patients responded that the product produced the itching sensation after consumption.

Among 30 patients 10 % of the respondents didn't like the smell and taste of the product as compared to the other nutritional supplement they used. Among 30 patients 9 didn't agreed to give pre and post examination report because of their economic conditions, Thus, changes in their weight was measured before and after consumption of the product and effectiveness of the product was seen.

**Table-1: Change in various parameters before and after protein supplements**

Particulars	Before Intervention	After Intervention	Paired 't'	df	P value
Total Protein	5.79±0.46	6.26±0.9	1.806	13	0.09814
Albumin	3.81±0.21	4.04±0.18	3.6126	13	0.0032*
Weight	45.8±8.15	47.78±6.48	1.51	7	0.1735
Uric acid	6.72±0.83	6.83±0.82	1.73	13	0.1079
Urea	176.34±24.35	179.45±23.42	2.69	13	0.0186*
Creatinine	7.85±1.9	7.8±1.84	1.13	13	0.278
Phosphorous	5.63±0.77	6.05±0.71	2.65	13	0.0198*
Calcium	8.7±0.72	8.96±0.79	2.76	13	0.0163*
Sodium	138±3.11	139.29±3.47	1.48	13	0.162
Potassium	5.34±0.77	5.2±0.8	1.37	13	0.1934

\*significant at P<0.05

The protein supplements have an effect on the various indicators. Table 1 revealed the albumin count has increased significantly from 3.81±0.21 before intervention to 4.04±0.18 after intervention at paired t 3.6126 at degree of freedom 13 and p value 0.0032. The increase in urea from 176.34±24.35 to 179.45±23.42 was significantly associated at paired t 2.69, df 13 and p value 0.0186. The phosphorous count increased

significantly from 5.63±0.77 before intervention to 6.05±0.71 after intervention at paired t 2.65 at df 13 and p value 0.0198. The increase in calcium from 8.7±0.72 to 8.96±0.79 was significantly associated at paired t 2.76, df 13 and p value 0.0163.

The remaining parameters as total protein, uric acid, creatinine, sodium, potassium and

weight were not found to be statistically associated. Before the distribution of the product the physical examination of the patients were done and after a month successive results were seen like:-Changes in paleness of skin, Changes in dryness in eye, Changes in roughness of skin, Refreshes in the face.

### Discussion

The interventional Study conducted for the first time in the National Kidney Centre, Kathmandu, Nepal among patients undergoing dialysis. The protein supplement (powder) manufactured by New Bellus Enterprises and distributed by Antah Pharma, Malaysia was provided to the patients for one month.

A very few study conducted to observe the change in various parameter after oral protein supplements. In our study albumin count has significantly increased from  $3.81 \pm 0.21$  before intervention to  $4.04 \pm 0.18$  after intervention. The study conducted by Poole R [2] supported our findings, the systematic review and meta-analysis conducted by Stratton RJ [4] also found significant increase in the albumin count after the oral protein supplementation.

Our study revealed various parameters as urea, phosphorous and calcium to be significantly

increased after protein supplementation. The remaining particulars as total protein, uric acid, creatinine, sodium, potassium and weight were not found to be statistically associated. In contrast to our study, study conducted by Poole R revealed that weight was found to be significantly associated with oral protein supplements. The reason behind was our study only able to observe before and after weight of only seven participants.

### Conclusion

This study was found to be effective to change in various parameters as albumin, urea, phosphorous and calcium after protein supplement to the patients undergoing haemodialysis. Hence, the protein supplement was found to be effective for haemodialysis patients.

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### References

1. Daud MAZ, Tubie B, Adams J, Quainton T, Osia R, Tubie S et.al. Effects of protein and omega-3 supplementation, provided during regular dialysis sessions, on nutritional and inflammatory indices in hemodialysis patients. *Vascular Health and Risk Management* 2012; 8:187-195.
2. Poole R, Hamad A. Nutrition Supplements in Dialysis Patients: Use in Peritoneal Dialysis Patients and Diabetic Patients. *Advances in Peritoneal Dialysis* 2008; 24:118-24.
3. Chen J, Peng H, Zhang K, Xiao L, Yuan Z, et al. (2013) The Insufficiency Intake of Dietary Micronutrients Associated with Malnutrition-Inflammation Score in Hemodialysis Population. *PLoS ONE* 2013; 8(6): e66841. doi:10.1371/journal.pone.0066841
4. Stratton JR, Bircher G, Fouque D, Stenvinkel P, Mutsert DR, Engfer M et al. Multinutrient oral supplements and tube feeding in maintenance dialysis: A systematic review and Meta-analysis. *Am J Kidney Dis* 2005; 46(3):387-405.
5. Lindholm B, Wang T, Heimburger O, Bergstrom J. Influence of different treatments and schedules on the factors conditioning the nutritional status in dialysis patients. *Nephrol Dial Transplant* 1998; 13(6):66-73.
6. Dharmatti G, Jamdade T, Jeloka TK, Pandit M. Are oral protein supplements helpful in the management of malnutrition in dialysis patients. *Indian Journal of Nephrology* 2013; 23(1):1-4.

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