



THERAPEUTIC EFFECT OF SOYA BEAN CHUNKS SUPPLEMENTATION DURING HEMODIALYSIS

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Abstract

The present study was conducted during the year 2016-17 on 30 ckd-5 patients on hemodialysis admitted in various medical wards of the MLB, Medical College, Jhansi (U.P.) India. The primary data were obtained from all CKD patients 30 days intervals and three times first time proper medication with hemodialysis therapy and second time same condition patients with additional dietary counseling. The data was collected in all the patients, thorough anthropometric measurement, dietary history and blood are collected for analysis of Hb, serum albumin, blood urea, cholesterol and cretonne. The Proper dietary counseling along with high biological protein (20 gm) given during hemodialysis superior the nutritional value of undernourished chronic kidney disease patient. About proper diet counseling of the patients showed significant statistical positive (<0.005) response in a various nutritional factor like BMI, MUAC, Serum Albumin, hemoglobin, total calorie intake while the only medication and dialysis therapy showed an undergoing undernourished in their nutritional value.

The patients undergoing hemodialysis often develop protein-energy malnutrition which is related to mortality and morbidity rate increases. Special nutritional care is required for the dialysis patient to improve the net protein anabolism. The nutritional value of soya bean chunks in patients on HD requirements more attention providing one-to-one nutrition psychotherapy could be improvements in the patients.

Key words : Dialysis, malnutrition, soybean chunks, high biological protein.

Introduction

In the present time, chronic renal disease is the main problem for human health and its occurrence and prevalence are increasing. Ortiz *et al.* (2014) reported that worldwide, the annual report incidence of end-stage renal disease (ESRD) occurrences between 34 and 200 per million population and there is an even elevated number of people in the earlier stages of chronic kidney disease, facing undesirable outcomes such as kidney failure, cardiovascular disease and premature death. Ovi *et al.* (2014) and Maurya *et al.* (2018) revealed that the etiology of malnutrition in ESRD is multifaceted and may comprise poor food intake because of anorexia, nausea and vomiting due to uremia, hormonal derangements, acidosis and increased energy expenditure Proper nutrition may help to reverse the wasting syndrome. Several numerous studies have recommended a strong linked between nutrition and clinical outcome in hemodialysis patients.

Zha *et al.* (2017) and Kumar *et al.* (2017) stated that it is recommended that the superior to half of the protein intake should be of a high biologic value (HBV, nitrogen incorporated into the body/total absorbed nitrogen >75%), such as proteins in eggs, fish, meat and soya, dairy products. Lusas *et al.* (1995) studied that Soya chunks are made from soy beans and they work well as meat substitutes. Kaur *et al.* (1989) and Gulia *et al.* (2013) evaluated that the superior nutritional value of soya granules is attributed to the existence of whey proteins that are a rich source of essential amino acids. Sharma *et al.* (2016) observed that due to the high nutritional value of soya bean chunks is a superlative food for expectant mothers, infants, growing children, adolescents and adults.

Materials and Methods

The study was approved out at medicine department, MLB Medical College, Jhansi (U.P.) India, during the

Table 1 : Nutritional value of soybean chunks and cheese (Indian paneer) (100gm).

Nutrients	Soybean chunks *	Cheese (paneer)**
Energy (Kcal)	352	348
Protein (gm)	52	24.1
Carbohydrate (gm)	33	6.3
Fat (gm)	0.5	25.0
Sodium (mg)	0	18
Potassium (mg)	0	
Dietary fibre (gm)	13	
Crude fiber (gm)	01	-
Calcium (mg)	350	790
Iron (mg)	20	2.1

Sources- *Nutrela soybean chunks nutritional fact information

(<https://www.nutritionix.com/i/nutrela/soya-granules/59d87ba165d1dbf409222708>)

** ¹Gopalan. C, Rama Sastri B.V. and Balasubramanian, S.C., 2004, Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad.

**²Anita Sharma., Text book o Food Science and Technology (2017).

year, 2016-17 after getting approval from the Institutional Ethics Committee. The Human Ethical Committee approval number is NO-838/ SURGERY/ 15. This study, 60 consecutive CKD stage-5 patients in MLB, Medical College form February 25th, 2017 to December 30th, 2017. All the selected CKD patients included aged between 19 to 60 years and undergone hemodialysis at least 3 months

before and all the patients have regular hemodialysis for minimum 2 times a week. The patients are CKD-5 stage from last 3 months.

Both groups fulfilled pre- and post-test after 12 weeks the first with 30 patients undergo with hemodialysis at a regular interval, at least two times in a week and second, all patients were having the same condition as like group first but additional counseling proper diet. Suggested soy chunks like high biological protein. We have used 24 dietary recall and food frequency method. All CKD-5 patients in second groups taken 50 gm Nutrela (Ruchi Soya Industries Limited) soybean chunks per day, 5 ml of intravenous blood samples were collected in plain tubes after an overnight fast. Obtained serum / blood were analyzed for Hb, blood urea, serum electrolyte, Serum Albumin, Cholesterol, Creatinine. BMI is calculated in all patients (Suliman *et al.*, 2000). We were recorded Statistical data on Microsoft Excel programme. The comparison between two groups was done by paired t-test in Graph Pad Prism7 software.

Results

In the tables 2 & 3 studied different biochemical parameter significant difference between pre and post diet counseling with high biological protein like soya bean chunks, compare with another various study CKD-5 patients undergone regular dialysis. The result was analyze that serum HDL, Creatinine, Urea and random sugar level was not significant difference was detected at P<0.05 level. Weight means was 56.4 kg and SD was 5.5 kg significant difference showed at <0.0144, BMI

Table 2 : Biochemical tests of HD patients taking soybean chunk and not taking.

Biochemical Tests of CKD patients	Mean ±SD of CKD Patients undergone Hemodialysis with dietary Counselling in present study	P Value	Statistically Significant (P < 0.05)	Mean ±SD of CKD patients undergone Hemodialysis without Dietary Counselling (Dipika Barial <i>et al.</i> (2017)*	P Value	Statistically Significant (P < 0.05)
Urea (mg/dl)	141.42±33	<0.351	No	103.4± 32.4	<0.0001	Yes
Random Rbs	113.3±13	0.291	No	105.7±49.58	<0.6484	No
Cholesterol (mg/dl)	165.9±29.9	<0.29	Yes	173±19.4	<0.05	Yes
HDL-C (mg/dl)	51.06±6.8	0.2984	No	28.12±4.51	<0.0001	Yes
VLDL-C	29.8±8.5	<0.0001	Yes	49.29±8.54	<0.001	Yes
Triglycerides	144.22±43.85	<0.0001	Yes	246.4±42.7	>0.001	yes
LDL-C	86.9±20.4	<0.0001	Yes	103.1±13.60	<0.0017	Yes
Serum. Creatine (mg/dl)	10.0±2.6	<0.57	No	6.2± 1.08	<0.0001	Yes

HD: Hemodialysis, HDL-High density lipoprotein, VLDL- Very low-density lipoprotein, LDL- Low-density lipoprotein, Hb-hemoglobin.

Table 3 : A comparative study of present study Mean and standard deviation of biochemical tests to prior studies.

Nutritional assessment tests of CKD patients	Mean \pm SD of CKD patients undergone hemodialysis with Dietary counselling in present study	P Value	Statistically Significant (P < 0.05)	Nagabhushana S. <i>et al.</i> (2017)	Adithya B. R. (2015)	El-Sayead AS <i>et al.</i> (2015)	Alvarez-Ude F <i>et al.</i> (2002)	Hajira B <i>et al.</i> (2017)
Weight (Kg)	56.4 \pm 5.5	<0.0144	Yes					
BMI	21.4 \pm 1.7	<0.010	Yes					
MUAC	25.18 \pm 1.3	<0.0001	Yes					
Kcal	1613.5 \pm 132	<0.2325	Yes					
Hb(mg/dl)	6.8 \pm 1.8	<0.0001	Yes	8.21 \pm 2.57	8.45 \pm 1.424			
S.Albumin	3.48 \pm 0.3	<0.03	Yes	2.66 \pm 1.86	3.218 \pm 0.38	3.28 \pm 0.86	4.14 \pm 0.31	6.4 \pm 4.73
Kcal	1613.5 \pm 132	<0.2325	Yes					
Protein (gm/day)	61.4 \pm 3.7	<0.0001	Yes					
Urea (mg/dl)	141.42 \pm 33	<0.3519	No	129.34 \pm 22.63	134.06 \pm 20.08	127.1 \pm 20.21	186 \pm 39	202.22 \pm 46.93
Cholesterol	165.9 \pm 29.9	<0.29	Yes	132.45 \pm 40.46	155.83 \pm 36.71	81.3 \pm 17.4	186 \pm 39	
Creatinine (mg/dl)	10.0 \pm 2.6	<0.57	No	12.61 \pm 4.38	11.32 \pm 3.33	5.8 \pm 3.6	9.6 \pm 2.2	

S.albumin- Serum albumin, MUAC- Mid-Upper Arm Circumference, Kcal- Kilocalorie.

mean was 21.4 and SD was P <0.010, energy intake (Kcal) mean and SD was 1613.5 \pm 132, dietary protein intake mean was 61.4 and SD was 3.7 hemoglobin mean was 6.8 and SD was 1.8.Urea mean and SD was 141.42 \pm 33. Creatinine mean and SD was 10.0 \pm 2.6. Table 3 lipid profile constituents Cholesterol (mg/dl) mean and SD was 165.9 \pm 29.9. HDL (mg/dl) mean and SD was 51.06 \pm 6.8, VLDL (mg/dl) mean and SD was 29.8 \pm 8.5. Triglycerides (mg/dl) mean and SD was 144.22 \pm 43.85, LDL (mg/dl) mean and SD was 86.9 \pm 20.4

Discussion

The patients follow dietary 50 grams soybean chunks daily. The CKD-5 all patients adequate dietary counseling. Compare prior to another study that was not proper diet counseling. Blood urea, serum creatinine was elevated as expected. In table 3, serum urea, creatinine cholesterol and triglyceride were all above normal and elevated with the progression in the degree of malnutrition, whereas Hb level was low and the severity of anemia worsened with the degree of malnutrition the same fact observed (Zedeh, 2001). Eustace *et al.* (2004) revealed that in the case of hypoalbuminemia (serum albumin <3.5 mg/dl) 23 was found in moderately and rigorously malnourished patients. Blood urea, serum creatinine was elevated as expected.

Hunsicker *et al.* (1997) revealed that Chronic Kidney Disease (CKD) prognosis on to hemodialysis, diet maintains to play a crucial role in a patient's rehabilitative care. Chertow *et al.* (1996) well-balanced nutrition in the diet are necessary for them to keep on healthy as their kidneys are no longer performance at its full competence i.e. to get rid of the waste products and fluid from their blood. Locatelli *et al.* (2002) revised that it is essential for dialysis patients to have the precise quantity of protein, calories, fluids, vitamins and minerals each day. The current study compared with the previous study we observed that regular intake of high biological protein due to serum albumin is stable (3.48) and slightly better observed to (3.2), Adithya *et al.* (2015) and (3.21 mg/dl) Azhar *et al.* (2007), Serum cholesterol blow to (186 mg/dl), Alvarez-Ude *et al.* (2005) and (171 mg/dl), Hung-Yuan Chen *et al.* (2015), (173 mg/dl), Dipika *et al.* (2017). Abozead *et al.* (2015) evaluated that an increase in mortality and morbidity rates of hemodialysis patients have been found to be linked with reduce in BMI, MUAC, predominantly in patients with a BMI of 23 kg/m² or higher. Serum albumin also the recommended markers of malnutrition that decline with the progression of CKD.

Maurya *et al.* (2018) revealed that various studies have revealed an encouraging effect of dietary counseling

on the nutritional status of HD patients. Serum albumin in the present study (3.4 mg/dl) is better previous hemodialysis patients that were not taken high biological protein 2.66 mg/dl.

Conclusion

The experimental study shows that the nutritional incident in patients on HD requires more attention to nutrients quality. Indicating the need for regular individual dietetic counseling and assessment of anthropometric and biochemical status. The undernourishment in CKD is associated with high risk morbidity and mortality rates. Undergone dialysis patients lack appetite is a major problem to intake low dietary intake, so they need nutrients enriched high biological value food that had low sodium, potassium, phosphorus. The role of renal nutrition in the supervision of CKD is essential and needs to be further researched and planning newer guiding principle.

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