Chapter 6

SUMMARY AND CONCLUSION

Malnutrition is common in hemodialysis patients and closely related to morbidity and mortality. Therefore, assessment of nutritional status and nutritional management of hemodialysis patients play a vital role for better outcome of these. This study was carried out in the dialysis center of Sanjay Gandhi Post graduate Institute of Medical Science, Lucknow to determine the frequency and severity of malnutrition in dialysis patients, to evaluate the dietary approach and dietary compliance of dialysis patients, and to recommend an appropriate dietary modality for patients on maintenance hemodialysis.

Many studies showed patients undergoing maintenance hemodialysis (MHD) are wasted or malnourished. MHD patients have a high incidence of protein-energy malnutrition (PEM), which reflects the importance of maintaining an adequate nutrients intake.

Optimal monitoring of protein-energy nutritional status for maintenance hemodialysis patients requires the collective evaluation of multiple parameters, particularly using measures that assess different aspects of protein-energy nutritional status.

Many causes could lead to malnutrition. However, it seems that the most important one is the decreased nutrients intake of the patients. Poor nutrients intake could be due to anorexia from uremia, the dialysis procedure, and /or acidemia. Inadequate intake is also caused by co morbid physical illnesses affecting gastrointestinal function, depression, other psychiatric disturbances, organic brain disease, or socioeconomic factors.
In view of above cited observation, there is a need of further studies for better understanding of the cause of malnutrition in maintenance hemodialysis, in order to make improvement in nutritional status of maintenance hemodialysis patients.

**STATEMENT OF THE PROBLEM**

To assess the nutritional status of dialysis patients at S.G.P.G.I.M.S Lucknow.

**Objectives of the study**-

Present study is conduct to assess the malnutrition in hemodialysis patients with following objects:

- Prevalence of malnutrition in dialysis patients.
- Effect of dialysis doses on nutritional status.
- To assess the nutritional status of the patients by anthropometrically.
- To assess the nutritional status of patients by bio-chemical parameters.
- To assess the nutritional status of patients by three days dietary recall methods.
- To recommend an appropriate dietary modality for patients on HD.
- To educate the patients through multi and print media on nutrition and health.

**Methodology**

This study was carried among the End stage of renal disease (ESRD) patients who was on maintenance hemodialysis at Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow. This dialysis center is one of biggest dialysis center in the Uttar Pradesh with 50 hemodialysis machines. Three sessions morning, evening and night were running for dialysis and more than 150 patients covered by these sessions. This hospital was selected purposively, considering regular carried out in follow-up and feasibility of visiting this hospital in all session of dialysis.
The Pilot study was carried out in S.G.P.G.I.M.S., Lucknow.

In the pilot study, it was observed that the patients who had come from the ward in dialysis unit for dialysis; they were not taking maintenance dialysis. So ward patients had to be excluded.

**Sampling**

A total of 150 hemodialysis patients were selected from Sanjay Gandhi Post Graduate Institute of Medical Science, Lucknow to determine the frequency and severity of malnutrition in dialysis patients, to evaluate the dietary approach and dietary compliance of dialysis patients, and to recommend an appropriate dietary modality for patients on maintenance hemodialysis patients. During the first year of the study the registration of the patients were carried out until desired size of the sample achieved. The baseline registered patients were visited for follow-up after three months dialysis unit or diet clinic. Patient who did not turn up after baseline, had chronic illness or not able to continue dialysis therapy because of their financial problem or referred their local centre, or expired were excluded.

**Tools and Techniques**

The interview schedule (Appendix-1) was prepared to include all possible questions relevant to the objective of the study. It was prepared in English language and translated into local language. The schedule consisted of the following parts.

**General information**

A questionnaire was used to collect the following data from each patient’s name, hospital registration number, age, gender, diagnosis, dietary habits and duration of dialysis.
Anthropometric Assessment

Anthropometric measurements are valid and clinically useful indicators of the protein energy nutritional status in maintenance dialysis (MH) patients. These measurements include percent usual body weight, percent standard body weight, body mass index and mid upper arm circumference were measured in baseline and again it was repeated after three months in follow-up phase.

Bio-chemical Assessment

Hemoglobin, blood urea nitrogen, serum creatinine, serum sodium, potassium, albumin, total protein, and if patient was diabetic then fasting and post prandial (PP) blood sugar.

Dietary Assessment

Various food items consumed by the subjects during breakfast, lunch, evening tea and dinner were carefully documented with their actual measurements in this section. The guidelines were given to the patient or their relatives related with the method of recall, using house hold measurements to maintain diet chart .After three days recall diet chart was given to the patients as per their requirement and reports.

Knowledge Assessment

To assess the knowledge 10 questions were asked to the patients regarding dialysis therapy and diet in dialysis protein, sodium and potassium.

Statistical Analysis

Statistical analysis was done by the computer. Minitab 16 and MS Excel Software was used for data analysis and appropriate tests were applied as per objectives.
Variables were summarized by frequency and measures of central tendency and dispersion. Significant tests were used, including chi square test for measuring association between discrete variables and student t-test for measuring difference between continues variables. Correlation and partial correlation tests were used for measuring correlation between different variables.

Main findings

150 maintenance hemodialysis patients carried out in this study for the assessment of the nutritional status by anthropometrics, bio-chemical and dietary recall methods. The main findings of the study are summarized below:

GENERAL ASSESSMENT

- Most of the patients belonged to the age group of 50-60 years.
- Among 150 hemodialysis patients 111 were males and 39 per cent were females.
- Majority of hemodialysis patients had diagnosed with end stage of renal disease (ESRD) with hypertension and 36% had diabetic kidney disease.
- Majority of patients were 63% patients were vegetarian and they failed to achieve the required protein intake and not able to get the high biological protein.
- More than fifty percent (51.33%) hemodialysis patients started undergoing dialysis between 2-24 months.
- Majority of patients were taking dialysis twice weekly.

ANTHROPOMETRIC ASSESSMENT

- More than sixty (66.67%) patients had normal BMI in baseline and in follow-up it was (81.33%) and underweight observed in both group baseline and follow-up 24.67% and 15.33% in respectively.
- Negative association seen between baseline and follow-up body mass index.
- No major changes seen in weight and body mass index in both group.
• Follow-up patients had higher mean values for mid upper arm circumference compared to baseline.
• Highly significant difference was found in mid upper arm circumference of both group baseline and follow-up.
• There was no significant effect found in number of dialysis on change in weight as p value was 0.93 (>0.05).
• Effect of dialysis doses on body mass index was also not significantly.

**Bio-chemical Assessments**

• Majority of patients in both group belonged to deficient group (<10 gm/dl) with respect to hemoglobin 80% and 69% baseline and follow-up respectively.
• The mean serum creatinine and urea decreased significantly after dialysis but still remained higher than the normal range.
• Higher percentage of baseline had acceptable serum sodium and 28% patients had hyponatremia. In follow-up sever hyponatremia and hypernatremia was not found in these patients.
• Significant association observed between baseline and follow-up serum sodium.
• Majority of patients had normal serum potassium in both group. Percentage of these patients who had normal serum potassium were decreased in follow-up 50%. 44% were found in group of hyperkalemia and only 5% were hyppkalemic.
• There was significant association seen in baseline and follow-up serum albumin.
• It has been found that more than fifty percentage of the patients in S.G. P.G.I. showed a biochemical malnutrition indicator; these include hypoalbuminemia (51.33% moderate and 2.67% were sever).
• After intervention number of patients were increased who had low serum albumin because of less intake of protein as per requirement. 66.0% were moderate and 3.33% were sever 30.67% were found with normal serum albumin.
• Significant association seen between baseline and follow-up serum albumin of the patients.
Summary and Conclusion

- In baseline percentage of patients were high 84% who had normal total protein in comparison of follow-up 74.67%. Near about 25% were found with hypoproteinemia in follow-up but only 16% were found in baseline group.
- The significant association was found in between baseline and follow-up serum total protein.
- There was no significant association was found in fasting and post prandial blood sugar of diabetic patients.
- No significant effects seen of number of dialysis on follow-up serum albumin.

Dietary Assessment:

- The mean intake of calories, protein, fat and carbohydrate were less in baseline compared to follow-up nutrients intake.
- Significant difference seen in baseline and follow-up nutrients intake.
- The mean intake of all the nutrients viz., energy, protein, fat, and carbohydrate and were significantly higher in follow-up compared to required nutrients.
- The 3 days dietary record showed that most of the patients fail to attain the recommended energy and protein in both group.
- In follow-up case the dietary intake were increased in comparison of baseline but not as per requirement because loss of appetite. The highly significant difference were found in baseline and follow-up mean calories, protein, fats and carbohydrates p <0.005.
- Majority of the subjects in both the groups had low adequacy for all the nutrients.
- Highly significant difference found between before counseling knowledge and after counseling knowledge regarding diet and dialysis.
- All over awareness were increased after dietary counseling and education but there was no significant effect seen on their nutritional status.
Lastly, evaluating the prevalence of Protein energy malnutrition in hemodialysis before and after nutrition education had assist in verifying the importance of implementing nutritional management in hemodialysis patients.

CONCLUSION

Most of the patients on maintenance dialyses failed to maintain the required dietary energy and protein intake.

Anthropometric measurements (body mass index, skin fold thickness, estimated percent of body fat, and mid-arm muscle area, circumference, or diameter) are clinically useful indicators of protein energy nutritional status in our maintenance dialysis patients.

Hypoalbuminemia was associated with a combination of low dietary energy and protein intake, improvement of serum albumin needs an increase intake of both energy and protein.
Summary and Conclusion

The significant association was found between baseline hemoglobin and follow-up hemoglobin, and highly significant in blood urea nitrogen (BUN). Although no single ideal measure of nutritional status exists, the serum albumin level is considered to be a useful indicator of protein-energy nutritional status in maintenance dialysis patients. Highly significant association was found in serum albumin and total protein in baseline and follow-up.

Malnutrition is a strongly associated with morbidity and mortality, the attendance complications of protein energy malnutrition.

Dietary interviews and/or diaries are clinically useful for measuring dietary protein and dietary energy intake in our maintenance dialysis patients.

Limitation of the study

- There were a number of limitations to the present study.
- The study was conducted for a very short period of time which was not sufficient to know the effect of nutritional counseling.
- This study only describes the maintenance hemodialysis of SGPGIMS and cannot be generalized to other dialysis centers of Uttar Pradesh.
- This limited the number of patients and socioeconomic diversity of the hemodialysis patients.
- This study only describes the maintenance hemodialysis of SGPGIMS and cannot be generalized to other centers of Uttar Pradesh.
• One biochemical measurement, albumin, was evaluated to detect the nutritional status. Assessing more biochemical parameters would have given a more comprehensive indication of Protein Energy Malnutrition.

• The mean of energy and protein intake was assessed by 3 days dietary recall methods, if patients may have been subject to recall bias.