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EATING DISORDERS IN HEMODIALYSIS PATIENTS

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ABSTRACT

Protein energy malnutrition is more common among hemodialysis patients. There are number of factors which lead to PEM. Uremia, metabolic disorders, dysguesia, dietary restrictions, metabolic acidosis, medications etc are some of the reason which decreases the oral food intake. Anorexia is the predominant factor for eating disorder which has unknown etiology. This study aims to find out the most common eating disorders prevailed among hemodialysis patients. Gastro intestinal symptoms like nausea, vomiting, indigestion and heart burn were predominantly present and it positively affects the food intake. Despite normal anthropometric indices, the biochemical evaluation of nutritional status shows that hemodialysis subjects are not well nourished. Dietary intervention and nutrition education may help them to practice good eating pattern and thereby prevent gastro intestinal symptoms and malnutrition.

INTRODUCTION

Protein Energy Malnutrition (PEM) is more predominant in patients undergoing hemodialysis which is the powerful indicator for morbidity and mortality (Bossola et.al., 2005). Treatment modifications that can help to prevent or treat malnutrition are adequate dialysis dose, avoidance of acidemia, and addition of food supplements. Many factors are responsible for inadequate nutrient intakes in dialysis patients, among which anorexia is more prevalent among dialysis patients. Anorexia may be the result of uremic toxin accumulation, underlying illnesses such as diabetes mellitus with impaired gastric emptying, co morbidity, and acute superimposed illnesses such as peritonitis (in case of peritoneal dialysis) and infections. Persistent uremia due to inadequate dialysis is considered by far the most important anorectic factor for dialysis patients (Kopple, 1999). Eating disorder mainly anorexia reduces oral energy and protein intakes, thus contributing to the development of malnutrition and cachexia (Kalantar-Zadeh, 2004 and Carreroet.al., 2007). Bossola et al (Carreroet.al., 2007) in his study found that patients with eating disorders had low levels of serum albumin and total lympocytes, poor dietary intake and higher weight loss. Anorexia is common and often linked to persistent systemic inflammation, reduced quality of life, and increased mortality (Carreroet.al., 2007 and Kalantar-Zadeh, G.Block, 2004). The regulation of anorexia includes a complex hypothalamic process in which different appetite-regulating centers are affected not only by neuropeptides, but also by peripheral signals from fat tissue and the gut (Carrero et.al., 2008, Bossola, et.al., 2006 and Aguilera, 2004). This study helps in identifying the types of eating disorders prevailing among hemodialysis patients.

MATERIALS AND METHODS

SUBJECTS

Ninety patients on maintenance hemodialysis were enrolled from Kaliappa Renal Center, Chennai. The age group of the selected subjects was 18 to 74 years and subjects who had been on maintenance hemodialysis for at least 6 months were included in the study. Patients with hepatitis viral infection, who change their modality of treatment, were excluded from the study.

ASSESSMENT OF NUTRITIONAL STATUS

The anthropometric measurements such as body weight, height, skinfold measurement were assessed. These measurements were made after hemodialysis session by the investigator. Based on these measurements Body Mass Index (BMI), Tricep Skin Fold measurements (to measure body fat and fat free mass) were calculated. Body Mass Index (BMI) was calculated using the formula developed by Brokas [Dry Weight (Post dialysis weight) in kilograms/ Height in meter^2]. Mid Upper Arm circumference was measured by wrapping the flexible inch tape between shoulder and elbow in the non-fistula hand. Mid Arm Muscle Circumference was then calculated from the values of tricep skin fold and mid upper arm muscle circumference using the formula. Degree of malnutrition was identified using the Subjective Global Assessment (SGA) tool.

Biochemical parameters such as serum urea, creatinine, albumin, potassium and phosphorus were estimated using standard laboratory procedures. Clinical evaluations for the presence of fluid accumulation, hair loss, skin texture were identified. The daily average intake of nutrients such as energy, carbohydrate, protein, fat, phosphorus,   potassium   and

sodium were calculated from twenty four hour diet recall. This study focuses on identification of eating disorders and symptoms most commonly prevailed among maintenance hemodialysis patients. This was obtained by assessing the appetite level, satiety index, gastro intestinal symptoms such as nausea, emesis, indigestion, dyspepsia, regurgitation during on dialysis day and non dialysis day.

DIALYSIS TREATMENT

Information on mode of dialysis treatment such as frequency of dialysis, duration of per dialysis session, types of dialyzer used and frequency of dialyzer reuse were collected.

STATISTICAL ANALYSIS

Results were represented as mean ± standard deviation and percentage. The correlation between Subjective Global Assessment and Serum albumin was obtained by Chi-Square analysis.

RESULTS AND DISCUSSION

The general characteristics such as age and gender distribution are given in the table 1. The anthropometric measurements of selected hemodialysis subjects are depicted in the table 2. The clinical evaluation pertaining to the gastrointestinal symptoms are indicated as percentage distribution.

Table 1 - Age and gender distribution of selected hemodialysis subjects

Attributes	Mean±SD
Total number of patients	90
Male (%)	51
Female (%)	39
Age (years)	48.78±13.8

Table 2 - Anthropometric measurements of hemodialysis subjects

Attributes	Mean ±SD
Height (cms)	160.99±13.8
Dry weight (kgs)	53.96±12.84
Mid Arm Circumference (MAC) (cms)	19.49±4.88
Trisep Skin Fold (TSF) (mms)	12.44±10.11
Mid Arm Muscle Circuference (MAMC)	15.91±3.92

Table 3 - Body Mass Index (BMI) category of the selected hemodialysis subjects

BMI category	Reference (WHO, 2004)	Number of subjects (N=90)	Percentage %
Under Weight	<18.50	28	31.1
Severe Thinness	<16.00	10	11.1
Moderate Thinness	16.00-16.99	4	4.4
Mild Thinness	17.00-18.49	14	15.5
Normal Range	18.50-24.99	50	55.5
Over Weight	≥25.00	8	8.8
Pre Obese	25.00-29.99	8	8.8
Obese	≥30.00	4	4.4
Obese Class I	30.00-34.99	3	3.3
Obese Class II	35.00-39.99	1	1.1
Obese Class III	≥40.00	-	-

From the above table it was found that fifty five percent of the subjects had normal Body Mass Index (BMI), thirty one percent of the selected subjects were under weight and thirteen percent of the subjects were found to be obese.

Table 4 - Subjective Global Assessment (SGA)

SGA score	Degree of malnutrition	Number of subjects (N=90)	Percentage
1-14	Well nourished	35	38.9
15-35	Mild to Moderate	48	53.3
36-49	Severe malnutrition	7	7.8

SGA score was calculated based on the history and physical examination as described by Destky et al [10]. The history focused on 7 variables, namely; weight change in preceding 6 months and 2 weeks, change in dietary intake, presence of GI symptoms, and change in functional capacity, subcutaneous loss of fat, muscle wasting and edema. A seven point scoring system was applied to the above 7 variables. SGA scoring details of the selected hemodialysis subjects was summarized in Table 4.

DIALYSIS TREATMENT

In this study, sixty three percent of the subjects underwent hemodialysis therapy weekly twice; fifteen percent of the subjects took hemodialysis therapy weekly thrice. High flux polysulphone dialyser was used. The dialysers were reused after processing with renalin (formalin). Thirty four percent of the subjects reused the same dialyser for four times, eighteen percent of the subjects reused for six times, twenty percent reused for five times and nine percert of the subjects used disposable dialysers. Dialysis subjects reported that they reuse dialysers as they are cannot afford new dialysers for each time.

Table 5 - Biochemical evaluation of hemodialysis

| Attributes	Mean ±SD
Serum Urea (mg/dL)	108±29.79
Serum creatinine (mg/dL)	9.03±4.96

Sodium (mEq/dL)	135.96±13.63
Serum Potassium (mEq/dL)	5.44±0.52
Serum phosphorus (mg/dL)	5.62±1.61
Total cholesterol (mg/dL)	135.23±21.83
Triglycerides (mg/dL)	110.32±51.45
HDL (mg/dL)	30.02±4.33
LDL (mg/dL)	83.86±18.61
Serum albumin (mg/dL)	3.87±0.35
Serum bicarbonate (mg/dL)	17.71±9.80
Hemoglobin (mg/dL)	10.31±1.79
25 dihydroxycholecalciferol	15.88±11.43

From the above table of biochemical evaluation it was found that fifty four percent of selected subjects had hyperkalemia and forty three percent of the subjects were found to have normal potassium level. This findings correlates with the findings of Khedr *et al.,* (2009) who reported that higher serum potassium levels are due to poor diet compliance, weekly twice dialysis and use of acetate dialysate. Similarly sixty percent of the subjects were found to be hyperphosphatemic and thirty nine subjects were found to have normal serum phosphorus levels. This finding is concordant with the findings of Kimata *et al.,* (2005) who revealed that prevalence of hyper phosphatemia in hemodialysis subjects was high in spite of medical and dietary intervention. Serum albumin levels are the power indicator for morbidity and mortality in hemodialysis patients (Mutsert *et.al.,* 2009). In this study it was found that fifty seven percent of the subjects are hypoalbumic and thirty three percent of the subjects had their normal serum albumin concentration. This finding was reported by Centers for Medicare and Medicaid Services (Centers for Medicare and Medicaid Services, 2004).

EATING DISORDERS IN HEMODIALYSIS PATIENTS

Subjects who are undergoing hemodialysis have many gastrointestinal problems due to uremia which affects their food intake. Uremia is the predominant factor for the cause of poor eating habits since it creates disorders in the hormone production from adipose tissue, gastric problems, production and retention of neuropeptides (Aguilera *et.al.,* 2001).

Figure 1 - Appetite level of selected hemodialysis subjects
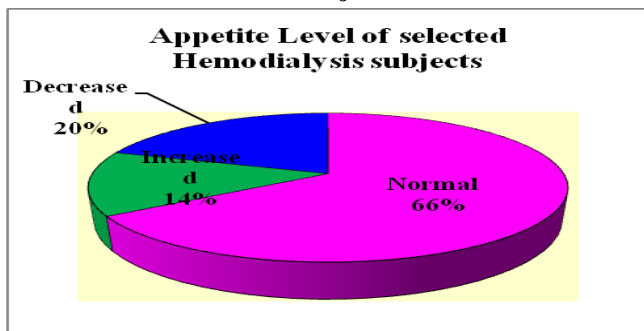
The above figure shows that sixty six percent of the subjects had normal appetite. Even though the appetite level was normal, participated subjects reported that they have early satiety when food is consumed.

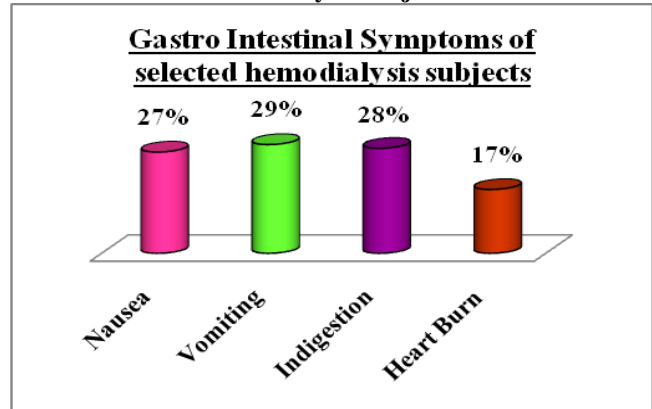**Figure 2 - Gastrointestinal symptoms of selected hemodialysis subjects**

Figure 2 depicts the gastro intestinal symptoms of hemodialysis patients. Almost twenty five to thirty percent of the selected subjects suffered from nausea, vomiting, indigestion and heart burn. These symptoms were more common because of uremia, inflammation, medications, interaction of blood with dialyzer membrane (which causes inflammatory cytokines) and infection. From the twenty four hour diet recall it was found that mean dietary intake was very low. The energy, protein and fat intake of the selected subjects were comparatively less than Recommended Dietary Allowance (RDA).

CONCLUSION

Anthropometric assessment of nutritional status shows that patients were mild to moderately malnourished. From the biochemical evaluation of nutritional status, nutritional parameters such as serum albumin (Patients are suffering from renal failure, Hypoalbuminia is there) also indicate that patients were not well nourished and have higher mortality risk. Gastro intestinal symptoms such as nausea, vomiting, indigestion and heart burn in hemodialysis patients will affect food intake and leads to malnutrition. Dietary education and nutrition counseling will help in preventing the gastro intestinal symptoms and help to reduce the risk of mortality.

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