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Assessment of nutritional status of haemodialysis patients in Viruthunagar District

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Abstract
The study was conducted to assess the nutritional status of haemodialysis patients in Viruthunagar district. A total of 66 subjects from both sexes having above 45 years undergoing haemodialysis were enrolled for the study. Information regarding disease history and associated morbidities were collected from patient's files. Nutritional status was assessed by anthropometric measurements using body mass index (BMI). The biochemical results including kidney profile, serum electrolytes and haemoglobin were recorded from the patient's files. Dietary data was obtained by using 24-hour dietary recall and food frequency questionnaire. The results indicated that age, familial predisposition, hypertension, diabetes and heart disease increased the risk for renal failure. Renal failure was more prevalent among male than in female. Actual intake of calories, protein, fats and minerals was lower than the recommended intake for haemodialysis patients. More than 50 percent of patient on haemodialysis were at risk of malnutrition. Malnutrition was related to low nutrient intake. This study suggests that assessment of nutritional status and nutritional management of haemodialysis patients play a central role in preventing malnutrition.

Keywords: haemodialysis, nutritional status, hypertension, diabetes, malnutrition

1. Introduction
Dialysis is a Greek word, dialysis means dissolution, 'dia' meaning through and 'lyses' meaning loosening or splitting. It is a process for removing waste and excess water from the blood and is used primarily as an artificial replacement for lost kidney function. Dialysis may be used for those with an acute disturbance in kidney function or progressive but chronically worsening kidney function, a state known as chronic kidney disease stage five. The latter form may develop over months or years, but in contrast to acute kidney injury is not usually reversible and dialysis is regarded as a "holding measure". Fadlaua. A.E., (2008) [10].

The kidney important roles in maintaining health. When, healthy kidneys maintain the body internal equilibrium of water and minerals (sodium, potassium, chloride, calcium, phosphorus, magnesium and sulphate). The acidic metabolism end products that the body cannot get respire are also excreted through the kidneys. (Mosawari. A.J., 2007) [7].

According to Garrow. J.S. *et al.*, (1996) [6] haemodialysis requires blood and dialysate circuits. Blood and dialysate are brought into the dialyser, which has an artificial membrane made of cellulose or other material. The dialyser is either 'flat-bed' with sheets of membrane to separate blood flows through microscopic Lumina in a bundle of thousands of hollow fibres, while dialysate circulates around the fibre.

During haemodialysis, blood is removed by way of special vascular access or shunt (usually in the nondominant forearm), heparinized, cleansed of excess fluid and waste products through a semipermeable membrane, and then returned to the patient's circulation. The dialysate is an electrolyte solution similar to the composition of normal plasma. Each of the constituents may be varied according to the patients' needs, the most common being potassium. (Grodner. M., *et al.*, 1996)

According to Anderson. S.L., *et al.*, (1996) [1] the average treatment lasts 2 to 4 hours and is usually performed three times per week. Haemodialysis can be performed or a dialysis unit by staff or patients who have received special training or it can be performed at the patient's home where a significant other or paid aid is required to assist in the procedure.

Haemodialysis may increase energy requirements because of lymphocyte stimulation and complement activation. Haemodialysis can performed at a dialysis centre or at home. There are two types of more frequent haemodialysis, short daily dialysis and nocturnal dialysis. This type of hemodialysis provide more treatment time with fewer side effects and risks; patients who receive more frequent hemodialysis may consume a more liberal diet than patients who receive thrice weekly conventional hemodialysis.

Hypotension is one of the common problems for people on hemodialysis. It can be caused by the drop in fluid levels during dialysis. Hypotension can cause nausea and dizziness. (Mosawi. A.J., 2004)

According to Lameire. N., (2000) the blood volume in haemodialysis patients is often lower than normal. This is due to reduced levels of the hormone erythropoietin, which is produced by the kidneys and regulates red blood cells production.

People receiving hemodialysis are at increased risk of developing sepsis (blood poisoning). This is where bacteria enter the body and spread through the blood. Potentially leading to multiple organ failure. Warning symptoms include dizziness and a high temperature (fever) of 38^0C. It can be treated with antibiotics. (Haslam. D.M., 2005) [9].

Patients can sometimes develop a condition called fluid overload. This was due to excess fluid building up in the body. Fluid overload can be mild and manifest itself as swollen ankles, or high blood pressure or severe breathlessness.

Materials and Methods
Location of the study
The hospital based study was carried out at the hemodialysis unit of Virudhunagar district hospital with the purpose to

observe and undertake the protocol followed in the hospital to assess the nutritional status of the patients visiting for hemodialysis and different wards for the treatment of chief complaints and associated co-morbidities.

Sample size
A convenient sample of 66 adult hemodialysis patients from both sexes were selected for the study.

Collection of data
Demographic and socioeconomic data
Data regarding socioeconomic status like occupation, marital status, education, family type, family size and monthly family income was collected by interviewing the subjects. Medical history and chief complaints Questionnaire regarding health status was filled from the subjects and their attendants. After being examined by the consultant, their chief complaints and medical history were collected from the recorded data in patient's file, patient himself/herself or their attendant and details were recorded.

Anthropometric assessment
The nutritional anthropometry is the measurement of body at various age and levels of nutritional status. It has been recognized as a reliable tool to identify the nutritionally vulnerable groups. Primary data was used for anthropometric assessment. (Geetha. 2014) [5].

Height
The samples should on bare foot in a flat floor against wall, with their feet parallel comfortably and a mark made on the wall. By using stadiometer reading were recorded in centimetress.

Weight
Weight may be recorded in pounds or kilograms. Weight measurement is the best indicators of growth failure in all the age groups. Ordinary simple clothes must be worn while weighing. (Joshi. S.A., 2012) [3].
The researcher was asked to stand on a weighing balance. The reading was recorded in kilograms.

Body Mass Index
By using height and weight Body Mass Index was calculated**.**
Body Mass Index is a measurement of body fat based on height and weight that applies to both men and women.
The BMI was calculated by using formula and to know the obesity and under nutrition grades.

Clinical assessment
For clinical assessment, each patient was interviewed for the uremic symptoms (anorexia, nausea, vomiting, headache and others) and examined for the signs of fluid over loaded and responses were recorded on the questionnaire. The recorded responses were then converted into percentages.

Biochemical assessment
About 2 ml blood samples were taken from each patient for the determination of kidney profile (blood urea, serum creatinine and glomerular filtration rate) serum electrolytes (sodium, potassium, chloride, bicarbonate) and 3 ml for Complete blood count (haemoglobin and WBC).

Dietary assessment
The nutritional needs of the individual or group are influenced by dietary practices, eating habits, economic situations, and agricultural practices.
In this study the researcher collect their food pattern, frequency of food intake, type of food consumption etc.

Results and Discussions
This hospital based study was carried out on 46 adult hemodialysis patients in order to assess their nutritional status.

Table 1: Age of the sample

S. no	Particulars	In percentage (N=100)
1	30-35	18
2	36-40	14
3	41-45	22
4	Above 45	46
	Total	100

Table I, figure shows that 46% of hemodialysis patient belongs to more than 45 years.
30-40 years of adults have high rate of renal failure due to their age factor.

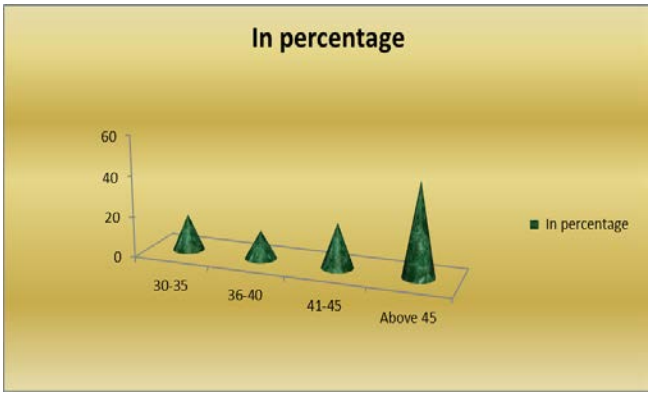

Fig 1: Age of the sample

Table 2: Marital status of the samples

S. no	Particulars	In percentage (N=100)
1	Single	12
2	Married	88
	Total	100

From the above table the researcher learnt among the total samples 88 percent were married and 12 percent were single.

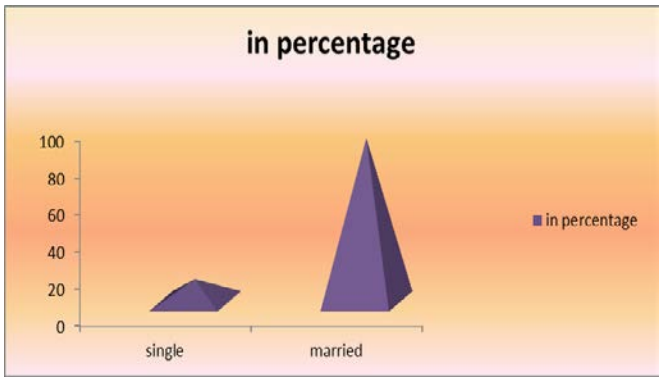

Fig 2

Table 3: Anthropometric assessment of the samples

S. no	Particulars	Normal Value	Mean value
1	Under weight	<18.5	-
2	Normal	18.5-24.9	21.0536
3	Over weight obese	25-29.9	-
4	Grade 1	30-34.9	-
5	Grade 2	35-39.9	-
6	Grade 3	More than 40	-

The table III shows that most of them to normal Body Mass index due to good dietary habits and few of them were found to be underweight due to Protein Energy Malnutrition and lack of food intake.

Table 4: Biochemical assessment of the samples

S. no	Particular	Obtained value	Reference value
1	Urea	78.64±62.26	10-50mg/dl
2	Creatinine	384.14±o.614	0.5-1.4mg/dl
3	Sodium	160.546±18.0348	135-145 m mol/L
4	Potassium	6.6504±2.3648	3.5-5 m mol/L
5	Red blood cells	2.6932±1.20148	4.5-5.5 MI/109

Due to less amount of red blood cells in blood which is a common complication of hemodialysis, poor absorption of iron and frequent blood test. Similarly urea, creatinine, sodium, potassium levels of the samples were found to be high when compared with normal values due to diet restrictions and removal of micronutrients during hemodialysis.

Table 5: Clinical assessment of the sample

S. no	Particulars	Normal	Abnormal
1	Hand	80	20
2	Eyes	8	92
3	Skin	80	20
4	Legs	32	68

92 percent of them were having pale eyes and 20 percent of them have spoon shaped nails due to anaemia. 68 percent had oedema and restless leg syndrome and 20 percent were found to be rashes in their skin and legs due to dryness and itching.

Conclusion

The kidney have important role in maintaining health. The healthy kidneys maintain the body internal equilibrium of water and minerals (sodium, potassium, chloride, calcium, phosphorus, magnesium, sulphate). The acidic metabolism end products that the body cannot get respiration are also excreted through the kidneys.

Hemodialysis is using an artificial kidney machine removes toxic substances from the blood and helps to restore nutrients and metabolites to normal blood vessels. Dialysis usually started when glomerular filtration rate is less than 15 ml per minute and the client develops symptoms of severe fluid overload, high potassium levels, acidosis or uraemia

From the study it was concluded that age, hypertension, diabetes and heart disease increased the risk for renal failure. Renal failure was more prevalent among male than in female and actual intake of calories, protein, fats and minerals was lower than the recommended intake for hemodialysis patients. More than 50 percent of patient on hemodialysis were at risk of malnutrition.

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