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AN EPIDEMIOLOGICAL STUDY OF HAEMODIALYSIS PATIENTS IN A TERTIARY CARE SOUTH INDIAN TEACHING HOSPITAL

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Abstract:
Kidney transplantation in India is limited by the lack of cadaveric donors, limited availability of suitable living-related donors and economic factors. Thus the majority of patients with renal failure remain dialysis dependent. This study may give the information about the essentiality to avoid the progression of the kidney diseases by controlling the risk factors and to prevent & manage the complications associated with haemodialysis and it also provide the epidemiological data to the healthcare system, It helps in the prevention of kidney disease and planning for the provision of renal replacement therapy. This is a prospective observational study which is carried out in the dialysis unit at RIMS, Kadapa, It is a 750 bedded multi-disciplinary tertiary care teaching hospital. Our study showing results that Hypertension and Diabetes mellitus are the leading causes for the kidney diseases and Weakness and Headache are the prominent intra dialysis complications which occurred during dialysis. Awareness of haemodialysis patients on the disease, medication, diet along with the life style modifications through the patient education was found to be very helpful for the patients to control their risk factors and to improve the compliance to the dosage regimen.
Key words: *Haemodialysis, Incidence, Prevalence, Tertiary care teaching hospital, South India.*

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INTRODUCTION:

Attention paid by the primary health care systems to combat the rising epidemic of chronic diseases has been inadequate. And so the health care administrative bodies have continued to expand dialysis services in terms of geographic coverage and capacity to cope with increasing demand. Kidney transplantation in India is limited by the lack of cadaveric donors, limited availability of suitable living-related donors and economic factors. Thus the majority of patients with renal failure remain dialysis dependent. This study may give the information about the essentiality to avoid the progression of the kidney diseases by controlling the risk factors and to prevent & manage the complications associated with haemodialysis. This study provides the epidemiological data which helps the healthcare system to guide strategies for the prevention of kidney disease and planning for the provision of renal replacement therapy.[1]

MATERIAL AND METHODS:

Aim:
To develop the comprehensive description of the epidemiology of haemodialysis treated patients at RIMS Dialysis Unit, Kadapa.

Objectives:
1. To assess the incidence and prevalence of patients undergoing dialysis.
2. To assess the cause of the disease and educating patients accordingly.
3. To assess the complications associated with haemodialysis
4. To provide the epidemiological data, this helps the healthcare system to guide strategies for the prevention of kidney disease and planning for the provision of renal replacement therapy.

1. Study design:
The study was a prospective observational study.

2. Study site:
The study "An epidemiological study of haemodialysis patients in a tertiary care teaching hospital in Kadapa" was carried out in the dialysis unit at RIMS, Kadapa; it is a 750 bedded multi-disciplinary tertiary care teaching hospital.
The study was approved by the **Institutional Ethics & Research Committee of Rajiv Gandhi Institute of Medical Sciences, Kadapa (Rc.No.413/Acad./2011-12)**, and with the consent of the Associate Professor of the General Medicine Department **(Dr. S. Chandra Babu M.B.B.S.,M.D.)**, Rajiv Gandhi Institute of Medical Sciences, Kadapa. Andhrapradesh.

3. Study duration:
The duration of the study was 6- months that was from March 2013 to September 2013.

4. Size of the study population:
180 haemodialysis cases were taken in this study.

5. Inclusion criteria:
Patients who are undergoing haemodialysis in the Dialysis Unit at RIMS.

6. Exclusion criteria:
Haemodialysis patients who are not willing to participate in this study.

Study procedure:
- A prospective observational study was conducted for six months duration (March-September'2013) in the dialysis unit at RIMS HOSPITAL, Kadapa.
- Based on the inclusion and exclusion criteria, the haemodialysis patients were recruited in the study.
- We have obtained the **Informed Consent Forms** from those who are willing to participate in the study.
- The data was collected from **Personal** (Patient and/or Patient representative) **interviews**, **Professional** (Doctors/Nurses/Technicians) **interviews** and **Chart review method** by using a well-structured questionnaire and followed up.
- All necessary and relevant baseline information was collected on the Patient data collection proforma.
- Patient information leaflet was provided and educated accordingly

STATISTICAL ANALYSIS
- The percentage method was used to analyze the patient distribution based on various parameters.
- The statistical (central tendency) parameters like mean, median and mode (range) were considered to analyze patient age distribution and dialysis duration.
- The appropriate statistical parameters were used to calculate the incidence and prevalence (Epidemiology) for Haemodialysis.

RESULTS:

A prospective, observational study was conducted for six months (Mar-Sep'2013) in the Dialysis unit of RIMS (Rajiv Gandhi Institute of Medical sciences) – A Tertiary care teaching hospital, Kadapa.

Evaluation of Data:
A total of 180 HD patients were attending for haemodialysis in the Dialysis unit of RIMS, from 15,532 IP (Inpatient) admissions during the study period. Out of 180 HD patients, 20 patients were

diagnosed as the new cases during the study period. The present study shows the Incidence for haemodialysis is 0.001 and the Prevalence for haemodialysis is 0.01.

I. Demographic Data of the HD patients:
1. Patient distribution based on gender:

Out of 180 HD patients, 141 (78.3%) patients were male and 39 (21.7%) patients were female. The incidence and prevalence for male HD patients is estimated as 0.0009 and 0.009 respectively where-as, they are 0.0003 and 0.003 for female HD patients respectively.

Table-1: Gender wise distribution

Sl. No.	Gender	No. of Patients (%)	Incidence	Prevalence
1	Male	141 (78.3)	0.0009	0.009
2	Female	39 (21.7)	0.0003	0.003

Table-2: Age wise distribution

Sl. No.	Age group (years)	No. of Patients	Percentage (%)
1	21-30	1	6.1
2	31-40	3	20.6
3	41-50	7	41.1
4	51-60	4	22.8
5	61-70	1	8.3
6	70-80	2	1.1

2. Patient distribution based on Age:
Out of 180 patients, majority of the patients 74 (41.1%) were found to be in the age group of 41-50 years. The mean age was 46.5±6.9 years with a median of 46 and a range of 41-50.

3. Patient distribution based on Personal History & Habits:
Among 180 patients, 74 (41.1%) patients were suffering from disturbed sleep, 64 (35.6%) patients were having altered bowel & bladder habits and 62(4.4%) patients were having altered appetite. Out of 180 patients, 58 (32.2%) patients were smokers and 39 (21.7%) patients were alcoholics.

4. Patient distribution based on Employment Status:
A. Patient distribution based on Previous and Current status:
Out of 180 HD patients, previously the patients were working for full time, part time & unemployed were 137 (76.1%), 1 (0.6%) and 42 (23.3%) patients respectively where-as currently only 3 (1.7%) patients are working for full time, 2 (1.1%) patients for part time and 175 (97.2%)patients are unemployed.

B. Patient distribution based on various currents Employment status:
Out of 180 HD patients, currently among them 3 (1.7%) patients are working for full time, 130 (72.2%) patients got retired due to disabilities (RD), 1 (0.6%) patient got retired due to age (RA),

2 (1.1%)patients are working for part time and 44 (24.4%) patients are unemployed.

II. Patient distribution based on Present Illness:
Out of 180 patients, 165 (91.7%) patients were suffering from CKD in which 128 patients were male and 37 patients were female and 15 (8.3%) patients were suffering from AKD in which 13 patients were male and 2 patients were female.

III. Patient distribution based on Past Medical History:
Out of 180 HD patients, 124 (68.9%) patients (Male patients-99 & Female patients-25) had HTN, 27 (15%) patients (Male patients-20 & Female patients-7) had both HTN & DM, 19 (10.6%) patients (Male patients-14 & Female patients-5) had DM alone and 4 (2.1%) patients (Male patients-3 & Female patients-1) had the drug induced kidney disease, 3 (1.7%) patients (Male patients-3 & Female patients-0) had genetic predisposition and out of the remaining 3 patients each had chemical exposure (Male patient), chicken gunea (Female patient) and viral infection (Male patient). The data shows male are more prevalent than female in each cause for haemodialysis.

IV. Patient distribution based on Present Medication History
Out of 180 HD patients, 44 patients (CKD-41 & AKD-3) are receiving Amlodipine, 43 patients

(CKD-38 & AKD-5) are receiving Atenolol, 21 patients (CKD-19 & AKD-2) are receiving Losartan and same as Clonidine, 5 patients (CKD-4 & AKD-1) are receiving Nifedipine and 10 patients are receiving Insulin alone where-as 15 patients are receiving the combination of Insulin and Amlodipine and 1 patient is receiving the combination of Metformin and Glimepiride.

V. Patient distribution based on Duration of Dialysis
Out of 180 HD patients, 30 (16.7%) patients were undergoing haemodialysis for >3 years, 77 (42.8%) patients were undergoing haemodialysis for the duration of 1-2 years where as 20 (11.1%) patients were undergoing haemodialysis <6 months period. The mean duration is 1.73 years.

Table-3: Patient distribution based on Duration of Dialysis

Sl. No.	Duration	No. of Patients	Percentage (%)
1	< 6 months	20	11.1
2	6 months – 1 year	27	15.0
3	1-2 years	77	42.8
4	2-3 years	26	14.4
5	3 years	30	16.7

VI. Risk Factors
1. Patient distribution based on Non–Modifiable risk factors
Out of 180 HD patients, the non-modifiable risk factors DM (Diabetes Mellitus) and genetic make-up were seen in 45 (25%) patients (Male patients-34 & Female patients-11) and 7 (3.9%) patients (Male patients-6 & Female patient-1) respectively where-as 128 (71.1%) patients (Male patients-101 & Female patients-27) had no any of the non-modifiable risk factors.

Table- 4: Patient distribution based on Non-modifiable Risk factors

Sl. No.	Risk factors	Male	Female	No. of Patients	Percentage (%)
1	DM	34	11	45	25
2	Genetic make up	16	1	7	3.9
3	Nil	101	27	128	71.

2. Patient distribution based on Modifiable risk factors
Out of 180 patients, majority of 129 (71.7%) patients (Male patients-103 & Female patients-26) were having elevated BP.

Table-5: Patient distribution based on Modifiable Risk factors

Sl. No.	Risk factors	Male	Female	No. of Patients	Percentage (%)
1	Elevated BP	103	26	129	71.7
2	Elevated BP + Uncontrolled blood glucose	23	7	30	16.7
3	Uncontrolled blood glucose	10	4	14	7.7
4	Anemi	0	2	2	1.1
5	Metabolic disturbance	1	0	1	0.6
6	Nil	4	0	4	2.2

VII. Dialysis – Complications
1. Patient distribution based on Intra Dialysis Complications
Out of 180 HD patients, majority of 131 (72.8%) patients suffered from weakness followed by 70 (38.9%) patients suffered from headache.

Table-6: Patient distribution based on Intra Dialysis Complications

Sl. No.	Complications	No. of Patients	Percentage (%)
1	Hypoxemia	0	0
2	Hypotension	5	2.7
3	Cramps	1	0.6
4	Nausea and vomiting	31	17.2
5	Fever and chills	36	20
6	Headache	70	38.9
7	Chest pain	11	6.1
8	Back pain	38	21.1
9	Itching	11	6.1
10	Weakness	131	72.8
11	SOB	5	2.7
12	Nil	27	15

2. Patient distribution based on Post Dialysis Complications

Out of 180 HD patients, majorly depression was observed in 155 (86.1%) patients and GI effects were seen in 33 (18.3%) patients where-as 23 (12.8%) patients had no any of the post dialysis complications.

Table-7: Patient distribution based on Post Dialysis Complications

Sl. No.	Complications	No. of Patients	Percentage (%)
1	Infections like HBV & HCV	0	0
2	Disequilibrium syndrome	0	0
3	Malnutrition	0	0
4	Cardiac arrhythmias	0	0
5	Hemorrhage	0	0
6	GI effects	3	1
7	Psychiatric Illness (Depression)	1	8
8	Nil	2	1

DISCUSSION:

Kidney diseases are highly prevalent globally. They have become a major public health problem and associated with considerable co-morbidity and mortality. Maintenance dialysis therapy is the commonest mode of Renal Replacement Therapy (RRT) and demand for this service is increasingly progressively worldwide. Over one million people worldwide are alive on dialysis. In UK, AKI requiring dialysis is 200ppm and in USA by 2010, >6 lakhs patients were on RRT (Dialysis). In India, it is estimated that about 1 lakh persons suffer from ESRD each year [2].

The risk factors for prevalence and incidence of haemodialysis are majorly hypertension and diabetes mellitus. Though haemodialysis is a better method of RRT, there are some complications associated with haemodialysis.

In our study, we had recruited 180 haemodialysis patients, from the results we obtained in our study, the average hospital bed strength statistics for a period of 6 months is 15,532 and the prevalence

for HD was estimated as 0.01. The incidence for haemodialysis was estimated as 0.001. There is a high prevalence and incidence for haemodialysis and this was supported by the study "**Epidemiology of haemodialysis patients in Aleppo city",** conducted by **Ghamez Moukeh et al.**[3] Out of 180 HD patients, 141 (78.3%) patients accounted as male and 39 (21.7%) were female. The prevalence for male HD patients is estimated as 0.009 where-as for female HD patients, it is 0.003. The incidence for male HD patients is estimated as 0.0009 where-as for female HD patients, it is 0.0003. So male are more vulnerable to haemodialysis. This is more or less concordant to a study conducted by **Wiam A A et al.** on "

Epidemiology and aetiology od dialysis treated end stage kidney disease in Libya" [4] The study shows, the age group 41-50 years were more prone to haemodialysis. The mean age was 46.5±6.9 years with a median of 46 and a range of 41-50. This is more or less supported by the study "**Epidemiology of haemodialysis patients in Aleppo city",** conducted by **Ghamez Moukeh et al [3]**.

In our study, most of the patients (41.1%) had disturbed sleep and this was supported by the study **"A study on insomnia in chronic renal patients on dialysis in Saudi-arabia"** conducted by **Hamdan H Al-Jahdali et al.** Of 180 HD patients 58 (32.2%) patients were smokers and 39 (21.7%) patients were alcoholics [5].

Out of 180 HD patients, 137 (76.1%) patients were working for full time previously where as currently only 3 (1.7%) patients continue the same, 130 (72.2%) patients are got retired due to disabilities, 3 (1.7%) patients shifted to part time work and 44 (24.4%) patients remained unemployed. This was supported by the study **"Clinical epidemiology of long bone fractures in patients receiving Haemodialysis"** conducted by **Kaneko TM et al [6].**

In our study CKD patients (91.7%) were more compared to AKD patients (8.3%) who are prone to haemodialysis. The leading causes for HD are HTN (68.9% patients) and HTN + DM (10.6%). The data shows male patients are more prevalent than female patients in each cause for haemodialysis. This was supported by the study **"Epidemiology of haemodialyis patients in Menofia governorate, Delta region, Egypt"** by **Ahmed Zahran [7].** Most of the HD patients are treated with the drugs like Amlodipine, Atenolol, Losartan, Clonidine, the combination of Insulin + Amlodipine and the combination of Insulin + Metformin.

Out of 180 HD patients, 30 (16.7%) patients were undergoing haemodialysis for >3 years, 77 (42.8%) patients were undergoing haemodialysis for the duration of 1-2 years where as 20 (11.1%) patients were undergoing haemodialysis <6 months period. The mean duration of the haemodialysis is **1.73 years.**

Our study shows, most of the patients (25%) have the non-modifiable risk factor - DM (diabetes mellitus) and 129 patients (71.7%) have Elevated BP as the modifiable risk factor. This was supported by the study "**Epidemiology of haemodialysis patients in Aleppo city",** conducted by **Ghamez Moukeh et al [3].** Male patients are more prevalent than female patients to the both Modifiable and Non-modifiable risk factors. Most of the patients were suffered from the intra dialysis complications (occurred during dialysis) such as weakness (72.8%) and headache (38.9%) where-as the post dialysis complications (occurred after dialysis) like psychiatric illness (depression) and GI effects were observed in 86.1% patients & 18.3% patients respectively.

CONCLUSION:

In KADAPA region, there is a relatively high prevalence and incidence of Haemodialysis. Hypertension and Diabetes mellitus are the leading causes for the kidney diseases. Weakness and Headache are the prominent intra dialysis complications which occurred during dialysis. This data will be helpful to the health care system to guide the strategies for the prevention of kidney diseases and planning for the provision of RRT (Renal Replacement Therapy). Awareness of haemodialysis patients on the disease, medication, diet along with the life style modifications through the patient education was found to be very helpful for the patients to control their risk factors and to improve the compliance to the dosage regimen.

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