ASSESSMENT OF COMPLICATIONS OF HEMODIALYSIS PATIENTS IN A TERTIARY CARE SOUTH INDIAN TEACHING HOSPITAL

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ABSTRACT

Chronic kidney disease is a progressive loss of function occurring over several months to years, and characterized by the gradual replacement of normal kidney architecture with interstitial fibrosis. Chronic kidney disease globally resulting in 735,000 deaths in 2010 up from 400,000 deaths in 1990,to develop the comprehensive description of the epidemiology of hemodialysis treated patients a prospective observational study was carried out between March 2013 and September 2013 at Rajiv Gandhi Institute of Medical sciencesan 800 bedded tertiary care teaching hospital, Kadapa. A total of 180 patients were studied during this period out of which 141 (78.3%) patients were male and 39 (21.7%) patients were female, majority of the patients 74 (41.1%) were found to be in the age group of 41-50 years, least 2 (1.1%) patients were found in the age group of 70-80 years, 58 (32.2%) patients were smokers and 39 (21.7%) patients were alcoholics,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, This study concludes that there is a high prevalence and incidence of Hemodialysis in the Kadapa region. Hypertension and Diabetes mellitus are the leading causes for the kidney diseases.Awareness of hemodialysis patients on the disease, medication, diet along with the life style modifications through the patient education will be helpful for the patients to control their risk factors and to improve the compliance to the dosage regimen.

Key Words: Hemodialysis, Chronic Kidney Disease, Patient Safety, HTN & DM.

INTRODUCTION

Chronic kidney disease (CKD) also called chronic renal insufficiency (CRI), is defined as a progressive loss of function occurring over several months to years, and is characterized by the gradual replacement of normal kidney architecture with interstitial fibrosis[1]. Chronic kidney disease globally resulted in 735,000 deaths in 2010 up from 400,000 deaths in 1990[2].

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In Canada 1.9 to 2.3 million people have chronic kidney disease. In the US, the Centers for Disease Control and Prevention found that CKD affected an estimated 16.8% of adults aged 20 years and older, during 1999 to 2004. UK estimates suggest that 8.8% of the population of Great Britain and Northern Ireland have symptomatic CKD[3]. Over 1 million people worldwide are alive on dialysis or with a functioning graft. Incidence of CKD has doubled in the last 15 years. In the USA, ~30 million people suffer from CKD and by 2010, >600 000 patients will require renal replacement therapy, costing US$28 billion .Risk factors for developing CKD differ between races and countries[4]. It is estimated that about 100,000 persons suffer from Renal Disease each year of which only about 20,000 get treated. Over three-fourths of the people suffering from ESRD do not get treated well. Affordability is hampered by low incomes, low reimbursement for chronic illnesses and low penetration of insurance. This is unique to India as most other countries in Asia reimburse a large proportion of a patient spent on dialysis

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through social welfare means. Mean average age of Renal Disease patients in India is between 32 to 42 years comparing to 60 to 63 years in developed countries the major contributing factors are diabetes and cardiovascular diseases. Renal transplant in India is severely curtailed due to issues such as possible exploitation and cadaver program[5, 6]. The present study is focused on the epidemiological statistics of the patients who are undergoing the hemodialysis in the tertiary care teaching hospital located in the southern Indiaand the discussion was intended to emphasize the healthcare system to guide strategies for the prevention of kidney disease and planning for the provision of renal replacement therapy.

METHODOF STUDY:

A Prospective Observational Study was carried out at Rajiv Gandhi Institute of Medical Sciences(RIMS), an 800 bedded tertiary care teaching hospital, Kadapa. The study was approved by the Institutional Ethics & Research Committee ofRIMS, Kadapa with (Rc.No.413/Acad./2011-12).

Study period: March 2013 to September 2013 (6 months)

Study population:180 hemodialysis cases were taken in this study

Study Materials: Patient data collection proforma, Informed consent form, Patient information leaflet

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

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

RESULTS:

A total of 180 HD patients were attending for haemodialysis in the Dialysis unit of RIMS 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. 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. The data is represented in Table No. 1 Out of 180 patients, majority of the patients 74 (41.1%) were found to be in the age group of 41-50 years, least 2 (1.1%) patients were foundin the age group of 70-80 years represented in the Table No. 2. The mean age was 46.5±6.9 years with a median of 46 and a range of 41-50. 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 (Table No. 3). 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 (Table no. 4).

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) (Table No. 5). 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 (Table No. 6). 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 No. 7). 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 No. 8). Out of 180 patients, 129 (71.7%) patients (Male patients-103 & Female patients-26) were having elevated BP, 30 (16.7%) patients (Male patients-23 & Female patients-7) were having both elevated BP and uncontrolled blood glucose and 14 (7.7%) patients (Male patients-10 & Female patients-4) were having uncontrolled blood glucose alone, 2 patients (female only) were having anemia, 1 patient (male) was having Metabolic disturbances as modifiable risk factors where-as 4 patients (male only) had no any of modifiable risk factors (Table No. 9). Out of 180 HD patients, 131 (72.8%) patients suffered from weakness, 70 (38.9%) patients suffered from headache, 38 (21.1%) patients suffered from back pain, 36 (20%) patients suffered from fever & chills, 31 (17.2%) patients suffered from nausea & vomiting, 11 (6.1%) patients suffered from itching and same as from chest pain, 5 (2.7%) patients suffered from SOB and same as from hypotension

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and 1 (0.6%) patient suffered from cramps where-as 27 (15%) patients had no any of the intra dialysis complications (Table No. 10)
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 No. 11).

Table No. 1: Distribution of patients according to the Gender

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 No. 2: Age wise distribution

Sl. No.	Age group (years)	No. of Patients	Percentage (%)
1	21-30	11	6.1
2	31-40	37	20.6
3	41-50	74	41.1
4	51-60	41	22.8
5	61-70	15	8.3
6	70-80	2	1.1

Table No. 3: Patient distribution based on Personal History & Habits

Sl. No.	Personal History & Habits		No. of Patients	Percentage (%)
1	Personal History	Smokers	58	32.2
		Alcoholics	39	21.7
		Disturbed sleep	74	41.1
2	Habits	Altered appetite	62	34.4
		Altered bowel and bladder	64	35.6

Table No. 4: Patient distribution based on Present Illness

Sl. No.	Present illness	Male	Female	No. of Patients	Percentage (%)
1	CKD	128	37	165	91.7
2	AKD	13	2	15	8.3

Table No. 5: Patient distribution based on Past Medical History

Sl. No.	Causes	Male	Female	No. of Patients	Percentage (%)
1	HTN	99	25	124	68.9
2	DM	14	5	19	10.6
3	HTN & DM	20	7	27	15.0
4	Drug induced	3	1	4	2.1
5	Genetic	3	0	3	1.7
6	Others	2	1	3	1.7

Table No. 6: Patient distribution based on Present Medication History

Sl. No.	Medication	No. of Patients	CKD	AKD
1	Clonidine	21	19	2
2	Losartan	21	19	2
3	Atenolol	43	38	5
4	Amlodipine	44	41	3
5	Nifedipine	5	4	1
6	Insulin + Amlodipine	15	15	0
7	Insulin + Nifedipine	4	4	0
8	Insulin	10	10	0
9	Glimepiride	1	1	0
10	Metformin + Glimepiride	1	1	0
11	Metformin	6	6	0
12	Metformin + Amlodipine	8	8	0
13	Metformin + Insulin	1	1	0

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Table No. 7: 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

Table No. 8: 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	71.1

Table No. 9: 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	Uncontrolledblood glucose	10	4	14	7.7
4	Anemia	0	2	2	1.1
5	Metabolic disturbance	1	0	1	0.6
6	Nil	4	0	4	2.2

Table No. 10: Patient distribution based on Intra Dialysis Complications

Sl. No.	Complications during Hemodialysis	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

Table No. 11: Patient distribution based on Post Dialysis Complications

Sl. No.	Post Dialysis 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	33	18.3
7	Psychiatric Illness (Depression)	155	86.1
8	Nil	23	12.8

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DISCUSSION

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 GhamezMoukehet al[7]. 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 Aet al[8] on "Epidemiology and aetiology od dialysis treated end stage kidney disease in Libya" The study shows, the age group of 41-50 years recorded high inundergoing 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 GhamezMoukehet al[7]. 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-Jahdaliet al[9]. Of 180 HD patients 58 (32.2%) patients were smokers and 39 (21.7%) patients were alcoholics. 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[10]. In our study CKD patients (91.7%) were more compared to AKD (Acute kidney disease) patients (8.3%) who are undergoing 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[11]. 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 GhamezMoukehet al[7]. 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

This study concludes that In Kadaparegion; 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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