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RESEARCH ARTICLE

A descriptive study of Sociodemographic characteristics, haemodialysis pattern and health expenditure among chronic kidney disease patients on haemodialysis in a tertiary care hospital in Kerala, India.

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Abstract: ***Introduction:*** Chronic kidney disease (CKD) is an emerging public health problem due increase in non-communicable disease. Long-term dialysis is expensive and leads to catastrophic healthcare expenditure. ***Aims and Objectives:*** 1. To study sociodemographic characteristics of end stage renal disease (ESRD) patients on Haemodialysis in a private tertiary care institute 2.To study the Haemodialysis practice patterns among participants 3.To study the treatment expenditure of patients during Haemodialysis ***Materials and methods***: A cross-sectional study was conducted among 37 patients on haemodialysis for chronic kidney disease from a tertiary care hospital. Study was conducted using pre-tested semi structured questionnaire. Study analysis was done by data entry using excel and analysed using IBM SPSS 20 software. Measure of central tendency frequency and percentages were used. ***Results:*** 59.5% patients were aged more than 60 years and 75.7% were male. 16% were daily wage labourers. 37.3 % were on dialysis for 1-2 years. 89.1% suffered from diabetes mellitus. Average expenditure was estimated to be Rs 36,076. Major contributor for direct cost was dialysis charges, medication, travel cost and hired help. 35.1% patient took early retirement due to illness and average number of years due to early retirement was 8.3 ± 3.41 year. ***Conclusion:*** The study indicates a increased need for dialysis for more patients for longer duration as most patients had initiated dialysis in past 2 years. The employment of patient was effect in most patients. The average monthly expenditure on HD was much higher than average monthly income driving the patient to financial hardship.

Keywords: Health Financing, Chronic kidney disease, Healthcare cost, Catastrophic health expenditure, out of pocket expenditure

INTRODUCTION

The alarming raise in non-communicable disease and its strain on the health care system has directly or indirectly posed significant challenges, especially in countries like India where the primary care facilities are still developing, whereas secondary & tertiary care is sparely distributed. End-stage renal disease (ESRD) is the condition in which kidney function is inadequate for long-term survival without dialysis or kidney transplantation. Chronic kidney disease. The disease is predicted to become the fifth leading cause of death by 2040. Currently, the prevalence of chronic kidney disease (CKD) in India ranges from 9% to 17%.[1] Every year, about 2.2lakh new patients of End-Stage Renal Disease (ESRD) get added in India resulting in additional demand for 3.4 Crore dialysis every year.[2] Hypertension and Diabetes mellitus has been the major contributor for the raising prevalence of CKD.

The two major modality of treatment existing for management of ESRD are renal transplant and haemodialysis (HD). The former becomes a limited option due non availability of suitable owner, limited facilities performing transplant and non-affordability, sparing HD as only option for patients with CKD. A population-based study determined the age-standardised incidence of estimates that 225,000 people, are developing ESRD annually, at the current rates of CKD. Most individuals diagnosed with ESKF are between the ages of 30 and 60, which are the most productive years of life and hence their death has major consequences for families, society and national productivity.[3,4]

It was estimated that about 2.7 million people were on dialysis throughout the world in 2010. An equal number, however, needed dialysis but could not get it due to financial reasons. According to a study, in India, less than 10 percent of patients who require renal transplant receive transplant and relay on HD. Out of the fraction receiving dialysis, 66 percent discontinue owing to cost of treatment or death.[3] Studies have reported that Quality of life (QOL) of patients on dialysis is significantly reduced compared to general population. Loss of wage and economic dysfunction is major reason for poor QOL.[1,5]

The average cost of a session of HD in India in private sector ranges from Rs 1500 to Rs 2500. In addition, they need to pay for consumables, erythropoietin, iron injection, phosphate binders, lab tests, consultation and other cost accounting for the direct out of pocket expenditure.[5] Most patients need at least 2-3 sessions per week and have other co-morbidities posing significant burden on both financial and medical management of ESRD. Lack of availability of service, long waiting period and poor transport facilities to reach centres limits the utilization of HD in public sectors. As the use health insurance facilities are also spare leading to catastrophic health expenditure.

The Pradhan Mantri National Dialysis Programme (PMNDP) was rolled out on 07th April 2016 as part of the National Health Mission (NHM) for the provision of free dialysis services to the poor across India.[2] Kerala is southernmost state, ranking first in the country with respect to human development and health indicators. The state is now facing an increased burden of non-communicable diseases like diabetes mellitus and hypertension.[1] The state also provides subsidy to charges of dialysis and other procedures in private sector. Despite having better accessibility to advance healthcare facilities compared to other parts of country studies have reported crippling level of financial hardship among household with patient on dialysis.[6] A few studies have been conducted to understand the QOL and pattern of CKD in the region.[1,6,12, 13,14,15,16] This study indents to understand the sociodemographic and expenditure pattern that can help is channelising the need based programs for address the concern of CKD.

MATERIAL AND METHODS

A descriptive cross-sectional study was conducted among patients who were on hemodialysis. The study was conducted in patients attending PK Das institute of medical sciences, a private tertiary care center located in Vaniyamkulam, a rural area in Palakkad district of Kerala, southern state in India. Ethical clearance for the study was obtained from institutional ethical committee, PK Das institute of medical sciences. The patients were enrolled after obtaining permission from the hospital authorities.

The study was conducted between November 2019 to September 2019. Patients on hemodialysis for chronic kidney disease aged above 18 years were included in the study and those who were severely ill, on treatment for Alzheimer's or on anti-psychiatric or did not consent to practice were excluded. 39 patients were enrolled based on the conditions mentioned and 2 were excluded later due to missing data. The data was collected using a predesigned, semi-structured questionnaire using interview method after obtaining written informed consent from the participants. The questionnaire was divided into four sections, demographic profile, treatment history, treatment seeking behaviors and expenditure pattern.

Data was analysed using MS-Excel and analysed IBM-SPSS 20 software. Qualitative data was analysed using frequency and percentage and quantitative data was analysed using measures of central tendency like mean and measures of dispersion using Standard deviation.

RESULTS AND OBSERVATIONS:

The socioeconomic pattern of 37 patients studied in the study is depicted in table no 1. Nearly 60% of patients were aged more than 60 years and a significant proportion belonged to age group 40-60 years. 75.7% of patients were males and nearly one fourth were involved in salaried job and 16% were daily wage workers. 89.9% were from rural areas and more than 50% did not have any insurance.

The patient details related to CKD and treatment initiation is summarized in Table no 2. Nearly 50% patient had diagnosis in CKD was done less than year back and 43.3% of the dialysis is started since less than a year. AV fistula was most common. Diabetes was most common comorbidity associated with CKD (89.1%) followed by hypertension.

Table 3 shows the treatment seeking pattern in patients. 91.1% initiated the treatment in private sector. The distance between the facility and home was more than 5 Km in more than 75% patients. Most common reason for skipping the session was cost of session.

The average expenditure on direct of cost of dialysis is analyzed in table 4. The direct cost of dialysis is categorized as medical and non-medical. Maximum medical cost was for services charges and maximum non-medical cost was for hired help.

Table no 1 Demographic profile of patients on hemodialysis

Sl.no	Variable	Categories	Frequency	Percentage (%)
1	Age (in years)	18-20	2	5.4
		20-40	3	8.1
		40-60	10	27.0
		>60	22	59.5
2	Gender	Male	28	75.7
		Female	9	24.3
3	Residence	Urban	4	10.8
		Rural	33	89.2
4	Type of family	Nuclear	20	54
		3 generation	17	46
5	Education status	Primary School	2	5.4
		Secondary school	14	43.2
		Higher secondary school or diploma	7	18.9
		Graduation	10	27
		Post graduation	2	5.5
6	Occupation status	Currently employed in salaried job	9	24.3
		Retired	6	16.2
		Home maker	3	8.1
		Self-employed or business	7	18.9
		Daily wage laborer	6	16.2
		Unemployed	6	16.2
7	Monthly income (in INR)	10000-20000	4	10.8
		20000-30000	17	45.9
		30000-40000	10	27.0
		>40000	6	16.2
8	Usage of health schemes	Social/Public	10	27.0
		Private	5	13.5
		None	22	59.4

Table no 2 CKD treatment History

slno	Variable	Categories	Frequency	Percentage(%)
1	Duration since diagnosis of CKD(in years)	<1	21	57
		1-2	9	24
		2-4	6	17
		>4	1	3
3	Duration since initiation of hemodialysis (in years)	< 1	16	43.3
		1-2	14	37.8
		>2	7	18.9
4	Type of dialysis	AV Fistula	28	75.7
		Graft	2	5.4
		Vascular assess catheter	7	18.9
5	Periodicity of dialysis	Daily	2	5.4
		2-3 times/ week	35	94.6
6	Comorbidities	Diabetes mellitus	33	89.1
		Hypertension	20	54
		Cardiovascular disease	5	13.5
		Nil	4	10.8

Table no 3 Treatment seeking pattern among hemodialysis patients

Slno	Variable	Categories	Frequency	Percentage (%)
1	Type of facility treatment was initiated	Private	34	91.9
		Public	3	8.1
2	Distance of treatment facility from residence (in Km)	< 5	9	24.3
		5-10	4	10.8
		10-20	13	25.1
		>20	11	29.7
3	Type of medication used before dialysis	Allopathic	33	89.2
		Ayurvedic	2	5.4
		Mixed	2	5.4
	Change of facility in last 3 months	Yes	20	51.4
		No	17	48.6
4	Reasons for change of facility	Lack of required service	9	52.9
		Cost of treatment	4	23.5
		Change in treatment plan	7	41.1
5	Frequency of missing in last 3 months	Less than 4 sessions	4	10.8
		> 4 sessions	3	8.1
		Never	30	81.1
6	Reasons for skipping sessions	Non availability of booking slots	1	14.2
		Facility closed (holiday)	2	28.5
		Cost of session	4	57.3

Table no 4: Pattern of direct cost of expenditure on Hemodialysis (in last 4 weeks)

Categories	Mean expenditure (in INR)	Percentage of Mean monthly income (Rs 24589)	Percentage of Monthly income of regularly paid men (Kerala) (Rs 21091)
Medical			
Dialysis service charge	8425	34.2	39.9
Consumables for dialysis	3016	12.26	14.2
Medications	6300	25.62	29.8
Lab Investigation	2011	8.1	9.53
Doctor consultation	776	3.1	3.67
Nursing charges	655	2.66	3.10
Non- medical			
Travel	2662	10.82	12.6
Food	2076	8.44	9.84
Lodging	696	2.83	3.29
Hired help	8346	33.9	39.5
Others	1768	7.19	8.38
Total	**36,731**		

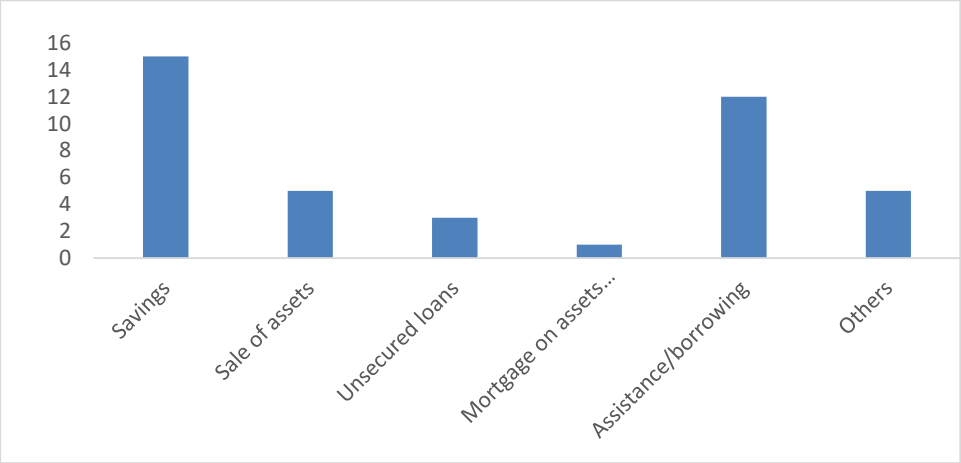
The average expenditure on direct of cost of dialysis is analyzed in table 4. The direct cost of dialysis is categorized as medical and non-medical. Maximum medical cost was for services charges and maximum non-medical cost was for hired help.

Table no 5: Pattern of indirect cost of expenditure on Hemodialysis (in last 1year)

Sl.no	Indirect cost		
1	Number of patients job is affected	Yes	70.2 (%)
		No	29.8(%)
2	Average days of loss of work (in last 1 year)	180±37.3	
3	Average loss of income (in last 1 year)	Rs 77961± 23331.66	
4.	Number of patients where bystander job was affected	Yes	17 (45.9%)
		No	20 (54.1%)
5	Average days of loss of work (in last 1 year) for bystander	96± 23.8	
6.	Average loss of income (in last 1 year) for bystander	Rs 97600± 14789.77	
7.	Number of patients who took early retirement	Yes	13 (35.1%)
		No	24 (64.9%)
8.	Average number of years lost due early retirement (in years)	8.3± 3.41	

The indirect cost is depicted in table no 5. 35.1% of patient the job was affected and nearly 35% had early retirement. The average loss of income was Rs 77961± 23331.66. and average years lost due to early retirement was 8.3± 3.41. Fig no 1 depicts the mode of coverage of treatment cost.

Fig no1 on mode of coverage of treatment costs



DISCUSSION

End stage renal disease is becoming more common in India every year. The high level of morbidity and increasing cost of management makes CKD and ESRD one of the most expensive medical conditions to treat worldwide raising a serious public health concern. This study conducted in a tertiary care center located in rural area had a mean age of patients 58 ±14.18 year, with majority of patients in age group of 60 years and above. It higher than the national estimate of 48.3±16.6 years as per CKD registry report data.7,21 Three-fourth of the participants were male. As per the report of CKD registry 21 which had 68.9 percent males and 31.1 percent females. The results were comparable with finding of studies of other studies in the region.1,6,13,15,18,19 . Studies conducted in other states Karnataka 8 and Maharashtra9 reported similar mean age and male predominance. Study conducted M. Adbdulsheed et al conducted in Nigeria 22 and study by Elif T et al in Turkey also reported comparable mean age6, but on Nigeria showed higher prevalence in male whereas Turkey they do not show a gender difference. Male gender in known non modifiable risk factor for non-communicable diseases predisposing to CKD like Diabetes and hypertension. When co-morbidities of study participants were assessed, it was noted that 89.1% of the suffered from diabetes mellitus and 54% had hypertension.

Most participants were unemployed and unable to work or retired. Ramesh et 8also reported 45.4 % who were employed are unable to work, similarly Kumar M et al 11reported 43% were unemployed. CKD has significantly affected the productivity of individual. The average number of days of loss of wage was 180±37.3, effecting 70.2% of patients with average loss of income was Rs 77961± 23331.66. Bradshaw C et al reported 91% of patients experienced catastrophic health expenditure.7 The patient's receiving subsidies were most affected. 35.5 % of patients had taken early retirement and average years lost due to early retirement was 8.3± 3.41years.

The mean duration of kidney ailments was 18.8. months with majority of the patients were diagnosed had been

diagnosed since less than 1 year. Majority (94.6%) than 2-3 sessions per week. Bradshaw C et al also reported similar pattern of management in patients receiving treatment in government setup.7 Rao AV et al17 and Kumar M et al 10 also found that most patients had a average of 2 session per week. Majority of the participants travelled more than 20km for each session followed by 11-15 km (27%). Around a quarter of the participants (24.3%) travelled less than 5 km to reach the session. The distanced travelled by patient remains a proxy for expenditure on non-medical direct expenditure. As patients on HD long-term care and average session being nearly 2 per week, accessibility for nearby centres hold prime importance. Under Pradhan Mantri National Dialysis Programme (PMNDP), the district hospital is being strengthened and Private public partnership model is being promoted. Improving the accessibility in community health centre, taluk hospitals and by mobile units can help in reducing the travel cost.2

When mean expenditure per month was assessed. It was noted that overall mean expenditure per month of participants was around Rs.36,076. This was distributed around service charges and consumables (Rs. 8425 and Rs.3016), medications which included erythropoietin injections and iron injections (Rs.6300), investigations including renal profiles (Rs.2011), monthly doctors consultations (RS.779), travel (Rs.2662), food (Rs.2076), lodging (Rs.696), hired help which included maid and home nurse (Rs.8346) and miscellaneous expenditures (Rs.1736). 27% of the participants had one or other mode of social security schemes for dialysis where was 30.4% of the participants did not have any schemes whereas in another study in Kerala,42.54% had to pay from their pocket without any assistance.6,12,13,20 Health insurance was present in 13.5% of the participants and 5.4% participants were given subsidy by the private institute. The maximum cost was paid as session charges followed by medication in direct medical cost, whereas travel and hired help constituted a major part of non-medical direct cost. Since the study was conducted in private hospital few patients received subsidy would only reduce the cost of session, other medical and non-medical out of pocket expenditure can have catastrophic financial hardship to the household. Majority patients have compensated the cost by exhausting their savings, seeking assistance or borrowing or by sale of assets.

The current was conducted in a single setting and had small sample size limiting its generalisability, however a large study in multicentre approach is suggested for better understanding. Recall bias related to expenditure pattern also existed in the study. The assessment was based on verbal survey using questionnaire. It was not cross checked with the hospital documents.

Pradhan Mantri National Dialysis Programme (PMNDP) launched in 2016-17 ensures availability of dialysis services free of cost to Below Poverty Line (BPL) beneficiaries at the district hospitals in the country. 2,19 With the objective to ensure accessibility and portability under One Nation-One Dialysis concept, National PMNDP portal was launched on 5th May 2022 17,18 and is operational across the states for registration of dialysis patients using Ayushman Bharat Health Account (ABHA) ID. Nair SB et al report indicated that dialysis centres at SDH/CHC have lacked availability of medicines and equipment, lacked trained human resource and non-availability of nephrologist.11

Out of pocket expenditure can be covered making the availability of nephrologist at least weekly basis at secondary and primary care facility from district or sub district hospitals, teleconsultation facility, Mobile dialysis units and availability of dialysis related medication at subsided rate through Private public partnership outlets .Capacity building of existing staff and promotion of dialysis technician courses in not private and public institution can help in meeting the increasing demand of trained Staff. The high cost of management of CKD as complication of Hypertension and diabetes also indicated the need for strengthening the primary and secondary prevention measures for non-communicable diseases as need of hour.

CONCLUSION

The present study shows an increased need of Haemodialysis with majority of the participants on dialysis have initiated dialysis in the last one year. CKD has affected the occupation and income of most of the patient and their family members. Most direct cost was paid for session and medications of HD and travel and hired help constituted major portion non-medical cost. Most household faced financial hardship due to HD.

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