ORIGINAL RESEARCH PAPER

Medicine

EVALUATION OF SURVIVAL PATTERNS AMONG PATIENTS ON MAINTAINENCE HAEMODIALYSIS

KEY WORDS: Esrd, Dialysis, Survival, Kaplan Meier, Bhopal

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ABSTRACT

INTRODUCTION- ESRD can lead to destruction of any organ, as well as impair physical and mental activity. The present study was thus conducted to assess the survival pattern amongst patients on maintenance haemodialysis.

METHODOLOGY- The present study was conducted as a prospective study at Department of Medicine, Gandhi Medical College and associated Hamidia Hospital, Bhopal for a period of 2 years i.e. from 1st August 2017 to 31st July 2019. All adult patients with ESRD (18 years and older) who were on maintenance hemodialysis for more than 3 months at Hamidia hospital and willing to come for follow up were included in the study. A detailed data regarding sociodemographic profile and history regarding dialysis were recorded and entered in questionnaire. Patients were followed up at 4 monthly interval for a total duration of 2 years and survival was noted. Data was compiled using Ms Excel and analysed using SPSS software version 20.

RESULTS- The study enrolled 100 patients with End stage renal disease with mean age of 53.4±17.5 years. Mean survival time following initiation of dialysis was observed to be 2.4 (CI-2.248-2.605) years. Mortality was significantly high amongst patients in advancing age (>60years), males, rural population, low socioeconomic status and no education ($p<0.05$). Mortality was significantly higher in patients with duration of dialysis more than 5 years, no compliance, femoral vascular access($p<0.05$).

CONCLUSION- The overall mortality documented in present study was 34% and mean survival time for patients with ESRD on hemodialysis was 2.4 (CI-2.248-2.605) years following initiation of dialysis. Advancing age, male gender, rural residence, lower socioeconomic status and illiteracy were the sociodemographic factors significantly related to low survival time. Also duration of dialysis, non compliance significantly affected survival pattern.

INTRODUCTION-

The prevalence of End stage renal disease (ESRD) is enormous that of kidney failure is rising. As per the Global burden of disease project report of WHO (2002), the diseases of the kidney and urinary tract contribute to the global burden of diseases—with approximately 850,000 deaths every year and 15,010,167 disability-adjusted life years. Globally, this is attributed to 12th cause of death and 17th cause of disability.[1] ESRD can lead to destruction of any organ, as well as impair physical and mental activity. It may also lead to disability, and premature death.[2]

Dialysis is a mandatory treatment in patients diagnosed with end-stage renal disease (ESRD) even though it is well known fact that dialysis cannot cure kidney failure.[3] However, the dialysis treatment and associated medical procedures substantially interfere with patient's life and survival. Survival of patients with ESRD is thus an important issue. Survival with acceptable health-related quality of life is the most desired goal in the treatment of ESRD patients.[2]

Mortality rates among patients with ESRD on hemodialysis (HD) exceed 20% per year, and a higher mortality rate within the first year after initiation of HD is been described.[4] Data from the 2004 Annual Dialysis Report indicate higher mortality rates for patients who have received HD for >5 years as compared with <2 year, suggesting that length of time on HD modifies mortality risk. Most patients begin HD with several comorbid conditions that may worsen or develop additional comorbidities with continued dialysis. (USRDS 2004). The present study was thus conducted to assess the survival pattern amongst patients on maintenance haem odialysis.

OBJECTIVE-

To study survival patterns of patients on maintenance haemodialysis.

METHODOLOGY-

The present study was conducted as a prospective study at Department of Medicine, Gandhi Medical College and associated Hamidia Hospital, Bhopal for a period of 2 years i.e. from 1st August 2017 to 31st July 2019. All adult patients with ESRD (18 years and older) who were on maintenance hemodialysis for more than 3 months at Hamidia hospital and willing to come for follow up were included in the study whereas patients who are starting hemodialysis for acute renal failure; patients on transient hemodialysis; patients who dropped out or lost to follow up or who were switched over to other forms of renal replacement therapy like continuous ambulatory peritoneal dialysis (CAPD) and renal transplantation were excluded from the study. The study included 100 patients using purposive sampling.

A detailed data regarding sociodemographic profile such as age, gender, residence, socioeconomic status, education and occupation was obtained and entered in semi structured questionnaire. Also detailed history regarding dialysis such as frequency of dialysis, delivered dialysis dose and vascular access was also recorded in questionnaire. Patients were followed up at 4 monthly interval for a total duration of 2 years and survival was noted.

STATISTICAL ANALYSIS

Data was compiled using Ms Excel and analysed using SPSS software version 20. Frequency was calculated for grouped data was calculated and expressed as percentage. Mean was calculated for numerical data. Survival pattern was analysed using Kaplan Meier method. P value <0.05 was considered highly significant whereas $p<0.01$ was considered highly significant.

RESULTS

The study enrolled 100 patients with End stage renal disease during the period of two years fulfilling the inclusion criteria.

Table 1- Distribution of patients according to demographic variables

Sociodemographic variables		Frequency (n=100)	Percent
Age group	<30	10	10.0

	31-40	15	15.0
	41-50	15	15.0
	51-60	23	23.0
	61-70	16	16.0
	>70	21	21.0
Gender	Male	69	69.0
	Female	31	31.0
Residence	Rural	68	68.0
	Urban	32	32.0
Socioeconomic status	Upper	9	9.0
	Middle	25	25.0
	Lower	66	66.0
Education	Yes	22	22.0
	No	78	78.0

Mean age of patients in present study was 53.4±17.5 years. Majority of patients belonged to 51 to 60 years of age (23%) followed by more than 70 years of age (21.0%). Only 10% patients belonged to less than 30 years of age. Majority of patients in present study were male (69%) whereas only 31% patients were females.

Majority of patients were resident of rural area (68%) and about 66% patients belonged to lower socioeconomic class followed by 25% and 9% patients belonging to middle and upper socioeconomic class respectively. Only 22% patients were educated in present study.

Table 2- Distribution according to factors related to dialysis

Dialysis		Frequency (n=100)	Percent
Duration before beginning dialysis (years)	≤1	27	27.0
	2	23	23.0
	3	17	17.0
	4	7	7.0
	5	11	11.0
	>5	15	15.0
Indication of dialysis	Uremic symptoms	66	66
	Volume overload/pulm edema	60	60
	Refractory HTN	44	44
	Electrolyte disturbance	22	22
	Uraemic encephalopathy/ seizures	15	15
	Severe metabolic acidosis	10	10
Dialysis compliance	Yes	25	25.0
	No	75	75.0
Vascular access	Femoral	32	32.0
	AV fistula	63	63.0
	Juglar	5	5.0

Duration before beginning dialysis was less than 1 year in 27% patients followed by 2 years in 23% patients. Uremic symptoms followed by volume overload (pulmonary edema) and refractory hypertension were the most common indications for dialysis documented in 66%, 60% and 44% patients respectively. Only 25% patients in present study were compliant to dialysis and the most common vascular access observed was AV fistula in 63% followed by femoral in 32% and juglar in 5% patients.

Overall mortality in present study was documented to be 34%. Mortality were observed at all follow up but maximum mortality were observed during 16 months (13.9%) followed by 12 months (12.2%) follow up.

Table 3- Mean survival time following initiation of dialysis

Mean			
Estimate	Std. Error	95% Confidence Interval	
		Lower Bound	Upper Bound
2.426	.091	2.248	2.605

Mean survival time following initiation of dialysis was observed to be 2.4 (CI-2.248-2.605) years.

Figure 1- Mean survival time following initiation of dialysis

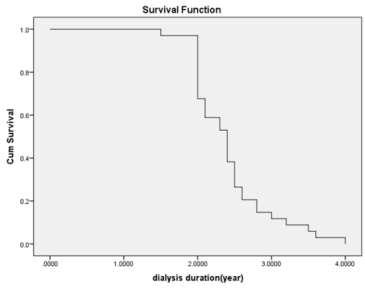

Table 4-Association of mortality with demographic variables

Variables		Total	Deaths	Alive	P value
Age group	<30	10	1	9	0.001
	31-40	15	1	14	
	41-50	15	2	13	
	51-60	23	6	17	
	61-70	16	9	7	
	>70	21	15	6	
Gender	Male	31	15	16	0.04
	Female	69	19	50	
Resident	Rural	68	28	40	0.02
	Urban	32	6	26	
SES	Upper	9	2	7	0.04
	Middle	25	4	21	
	Lower	66	28	38	
Education	Yes	22	3	19	0.02
	No	78	31	47	

Mortality was significantly high amongst patients in advancing age (>60years), males, rural population, low socioeconomic status and no education (p<0.05).

Table 5- Association of mortality with Dialysis

Variables		Total	Deaths	Alive	P value
Duration before beginning dialysis	≤1 year	27	18	9	0.001
	2	23	7	16	
	3	17	5	12	
	4	7	0	7	
	5	11	2	9	
	>5	15	2	13	
Dialysis compliance	Yes	25	4	21	0.03
	No	75	30	45	
Vascular access	Femoral	32	17	15	0.02
	AV fistula	63	16	47	
	Juglar	5	1	4	

Mortality was significantly higher in patients with duration of dialysis more than 5 years, no compliance, femoral vascular access(p<0.05).

DISCUSSION

The present study enrolled maximum patients in the age range of 51 to 60 years (23%) and the mean age of patients was 53.4±17.5 years. Majority were male (69%) whereas only 31% patients were females. Majority of patients were resident of rural area (68%) and 66% patients belonged to lower

socioeconomic class. Only 22% in present study were educated whereas remaining 78% patients registered were uneducated. Teixeira FI et al (2015) in their retrospective and longitudinal study on survival of hemodialysis patients at a university hospital assessed the medical records of 162 patients with mean age of 48.09±19.88 years and 72 (44.44%) were females and 90 (55.56%) were males.[6] Tu cu M et al (2018) in their retrospective cohort study enrolled 99 elderly dialysis patients with higher mean age i.e. 75 ± 7 years as compared to present study and majority of patients in the reference study were males similar to present study.[6] Chandrashekhar A et al (2014) in their study on survival analysis of patients on hemodialysis included 96 patients with mean age of 49.74 ± 14.55 years and maximum i.e. 75% were male.[7]

Mortality has been observed to be associated with duration of dialysis in various literature. In present study, duration before beginning dialysis was less than 1 year in 27% patients followed by 2 years in 23% patients. The most common indication of dialysis were uremic symptoms followed by volume overload (pulmonary edema) and refractory hypertension in 66%, 60% and 44% patients respectively. AV fistula was the most common site for vascular access in 63% followed by femoral in 32% and juglar in 5% patients. Only 25% patients in present study were compliant to dialysis whereas no compliance was observed in 75% cases. Yusop NB et al (2013) in their study in Malaysia documented mean duration of dialysis to be 55.2 ± 39.0 months ranging from 4 – 56 months.[8] In another study by Anees M et al (2011) on Dialysis-Related Factors Affecting Quality of Life in Patients on Hemodialysis, duration of dialysis was more than 8 months in 57.6% patients and AV fistula was the most common vascular access in 90.4% patients.[9]

The present study documented mortality in 34% patients. Most common cause of death was CVD observed in 58.8% followed by infections/sepsis (17.6%), CVA (8.8%). Kaplan Meier analysis revealed mean survival time following initiation of dialysis was 2.4 (CI-2.248-2.605) years. In a similar study by Shiburu T et al (2013), overall mortality was documented in 41 (45.1%) patients, of them 21 (23.1%) of patients died within the first 90 days of starting dialysis. Only 42.1% of them survived longer than a year. The causes of death documented in reference study were septicemia (34.1%) and cardiovascular diseases (29.3%).[10] Chandrashekhar A et al (2014) documented comparatively lower mortality rate as compared to present study. They reported 19.8% mortality. The mean time to death since start of hemodialysis was 176.84 days (5.9 months) and the estimated mean survival time was 570 days (19.2 months). Sepsis and ischemic heart disease (IHD) were the most common causes of death both accounting for nearly 60% of the overall mortality.[7]

The present study observed significantly high mortality amongst patients in advancing age (>60years), males, rural population, low socioeconomic status, no education, (p<0.05). The findings of present study were similar to study by Khazaei Z et al (2018), in which they observed age had a statistically significant impact on survival of patients.[11] Thus inclusion of higher age of patients could be the possible explanation for high mortality in present study. Various other studies have also shown that age, undoubtedly, is one of the significant risk factors for survival.[12,13]

Khazaei Z et al (2018) also found that males had a higher risk of mortality compared to females similar to present study but the occurrence was not statistically significant.[11] Peng YS et al (2013), showed that although women on hemodialysis had more depression-related score, but they have better survival than men.[14] In another study by Marinovicg S et al (2012), the mortality rate after one year was significantly greater in the "no income" group: 24.2% vs 20.9. The study documented survival in the "with income" group was significantly higher than in the "no income" group: 79.12% vs 75.76%, and the log-rank test (Mantel-Cox) resulted in a chi-square value of 22.49 (P=.000).[15]

Duration of dialysis is an independent risk factor for predicting mortality. In present study, mortality was significantly higher in patients with duration of dialysis more than 5 years, no compliance to dialysis, femoral vascular access, (p<0.05). Prabha DR et al (2016) observed that out of the total 107 deaths, 71 (66%) deaths occurred in the first 120 days after initiation of dialysis and 36 deaths (44%) occurred between 121 days and 365 days after initiation of hemodialysis, indicating a high period of risk in the first 4 months after initiation of dialysis.[16] Shiburu T et al (2013) in their study using Kaplan – Meier survival analysis documented median survival was 263 days with 62.1% of patients surviving their 90th day after starting dialysis. Also they showed that type of vascular access significantly affected both short-term and long term survival patterns. The median survival in patient using catheter, fistula and vascular graft was 2.8, 27.2 and 39 months respectively (P < 0.0001) similar to finding of present study.[10] Chandrashekhar A et al (2014) in their study also documented significantly higher mortality with duration of dialysis and dialysis dose (p<0.001).[7]

CONCLUSION-

The overall mortality documented in present study was 34% and mean survival time for patients with ESRD on hemodialysis was 2.4 (CI-2.248-2.605) years following initiation of dialysis. Advancing age, male gender, rural residence, lower socioeconomic status and illiteracy were the sociodemographic factors significantly related to low survival time. Also duration of dialysis, non compliance significantly affected survival pattern.

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