The Professional Medical Journal
www.theprofesional.com

ORIGINAL PROF-2572

DIABETIC PATIENTS;

CLINICAL PROFILE WITH ENDSTAGE RENAL DISEASE ON HAEMODIALYSIS

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Article received on:
30/06/2014
Accepted for publication:
15/07/2014
Received after proof reading:
16/10/2014

ABSTRACT… Objective: To study the clinical profile of diabetic patients on haemodialysis with a view to identify common clinical features and the trend of compliance with treatment and follow up. **Place and Duration of study:** Haemodialysis unit Fatima Memorial Hospital, Lahore, from January to August 2011. **Method:** Data collected from all patients above 14 years of age through medical history, record, examination and fundoscopy. **Results:** Out of total 76 patients on haemodialysis 50(65.7%) had DM and of these 42(84%) also had hypertension. Among diabetics 28 (56%) were male & 22 (44%) female. Mean age was 56.68 ± 9.09. Among these 15(30%) were illiterate and 27 (54%) belonged to lower social class. Ever smokers were 18(36%). Mean duration of diabetes since diagnosis was 10.9 ± 5.99. Mean duration of hypertension 8.28 ± 8.07, Duration of onset of dialysis 6 months to 8 years with mean 2.16±1.47. Retinopathy was found in 29(58%), 18(36%) had diabetic &11(22%) had hypertensive changes. Both fasting and random blood sugar levels were monitored by 28 (56%). None had regular follow up with HbA1c levels or urine for protienuria prior to onset of haemodialysis. Compliance with dietary advice & treatment claimed by 24(48%) and 36(72%) respectively. History of intake of Hakeem and homeopathic medications was found in 16(32%) and 10(20%) respectively. **Conclusions:** 65.7% of ESRD were diabetics. Majority were in 6th decade of life. Retinopathy was present in 58%. Low trend was observed towards compliance with treatment &follow up.

Key words: Diabetes mellitus, end-stage renal disease, retinopathy, hypertension, haemodialysis

Article Citation: Kitchlew R, Mazhar SA, Mirza IB, Jaffri AR. Diabetic patients; clinical profile, with endstage renal disease on haemodialysis. Professional Med J 2014;21(5):998-1004.

INTRODUCTION

Diabetes Mellitus is a major global health issue as there is an apparent epidemic among adults in both developing countries and industrialized world. Estimated number of diabetics in the world in 2013 is 382 million and by 2035 this will rise to 592 million[1]. This disease typically affects individuals in their most productive years[2]. Pakistan has the 7th highest number of diabetics aged 20-79 years in the world and according to WHO estimation this will rise to 4th highest by the year 2030. We have 7.1 million diabetics[3]. Since 1950s kidney disease has been recognized as a common complication of DM and almost 50% of patients with DM of 10-20 years duration develop this complication[4-6]. In USA, prevalence of diabetic kidney disease increased from 1988-2008 in proportion to prevalence of DM[6,7]. Despite the high prevalence of Diabetes mellitus and Chronic kidney disease in our population there is little published data from local studies using detailed participant clinical profile and examination for assessment regarding common clinical features and trend towards compliance with treatment and follow up. Our objective was to determine these features in patients on maintenance haemodialysis in local population.

MATERIALS AND METHODS

This observational descriptive study was done in the haemodialysis unit at Fatima Memorial Hospital Lahore from January to August 2011. Written informed consent was taken and Diabetic patients on haemodialysis of age more than 14 years in which Fundoscopy was possible, were included in the study. Data collection done through patients interview, medical records and clinical examination. Data analysis done on Statistical Package for Social Sciences (SPSS) version 17. Results were expressed as mean ± SD for all continuous numerical variables, frequency and percentage for categorical variables. Chi-square

test was used for comparison of qualitative variables. Student t-test was applied to determine the mean difference and independent sample t-test was used for mean difference between two groups. P-value <0.05 was considered significant.

RESULTS

A total of 76 patients were on haemodialysis and out of these 50(65.7%) had DM which became the study subjects. Among diabetics 28(56%) were male & 22(44%) female. Mean age was 56.68 ± 9.09 years. In those with diabetes of less than 10 years mean age for males and females was 53.09± 8.40 and 53.80±6 years respectively. Among these 15(30%) were illiterate. Out of these 27(54%) belonged to lower social class and 21(91%) females were housewives whereas 11(42 %) males were professionals and rest were involved with various other occupations. Number of ever smokers was18(36%) and all were male. Table-I presents the socio-demographic data.

Mean Age (years)	56.68 ± 9.09		
Sex	Male (n)	Female (n)	Total
	28 (56%)	22 (44%)	50 (100%)
Years of Education			
Nil	8 (53.3%)	7 (46.6%)	15(30.0%)
< 10 yrs	5 (50.0%)	5 (50.0%)	10 (20.0%)
10 yrs	4(50.0%)	4(50.0%)	8(16.0%)
12 yrs	3(100%)	0(.0%)	3(6.0%)
14 yrs	6 (54.5%)	5 (45.4%)	11(22.0%)
16 yrs	2(66.6%)	1(33.3%)	3(6.0%)
Total	28(100.0%)	22(100.0%)	50(100.0%)
Social Class			
Lower	27(54%)		
Middle	15 (30%)		
Upper	8 (16)%		
Smoking	18 (36%)	0	
Ever smoked	18 (36%)	0	
Current smoker	4 (8%)	0	
Non-smoker	32(64%)	0	

Table-I. Socio-demographic data (n=50)

10.9 ± 5.99 years. Out of these 29 diagnosed >10 years ago. Hypertension was also present in 42(84%). Mean duration of hypertension 8.28 ± 8.07 years while 26(61.9%) had it >10 years. Their systolic B.P ranged 100-175 mm Hg, Mean 139.5 ±17.09.Diastolic B.P ranged 60-100,Mean 79.5 ± 9.59 .Duration of onset of dialysis 6 months to 8years. Mean 2.16±1.47 years . Mean age in those on dialysis for less than 1 year was 61± 9.69 years and those on for more than a year was 53.97 ±7.66 years. 47(94%) were on dialysis for less than 4 years. Comparison of mean systolic and diastolic pressure in two groups i.e with blood pressure of more and less than 10 years revealed no significant difference (p=0.513 and0.895 respectively). Table-II presents clinical variables stratified by gender along with P values for differences between genders. However none of the parameters showed statistically significant difference except that more males were on thrice a week dialysis (P= 0.05).

Duration of Diabetes Mellitus		≥ 10 year	< 10 Years	t- test	p-values
		29 (58.0 %)	21 (42.0 %)		
Duration of hypertension		26 (61.9 %)	16 (38.1%)		
Systolic Blood Pressure		140.86 ± 16.907	137.62 ± 17.580	-.658	0.513
Diastolic Blood Pressure		79.66 ± 9.630	79.29 ± 9.783	-.133	0.895
		Male	**Female**		
Systolic Blood Pressure		137.68±14.108	141.82 ± 20.386	-.848	0.40
Diastolic Blood Pressure		80.00 ± 9.230	78.86± 10.227	0.412	0.68
Duration of Dialysis	**Male(n)**	**Female(n)**	**Total**	**Chi sq (df=1)**	**p-value**
≤ 1 Year	8 (42.1%)	11 (57.8%)	19 (38.0%)	2.401	0.121
> 1 year	20 (64.5%)	11 (35.5%)	31 (62.0%)		
Total	28	22	50		
Frequency of Dialysis	**Male(n)**	**Female(n)**	**Total**	**Chi sq (df=1)**	**p-value**
Thrice a week	18 (69.2 %)	8 (30.7%)	26 (52.0%)	3.848	0.05*
Twice a week	10 (41.6%)	14 (58.3%)	24 (48.0%)		
Total	28	22	50		
Retinopathy					
Diabetic Retinopathy	12 (66.6%)	6 (33.3%)	18 (36.0%)	0.07	0.796
Hypertensive	6 (54.5%)	5 (45.4%)	11 (22.0%)		
Both	2 (100%)	0	2 (4%)		
Total	18 (62.0%)	11(37.9%)	29(58%)		
Blood Sugar Monitoring					
Blood Sugar Fasting	22 (57.8%)	16 (42.1%)	38 (76.0%)		
Blood Sugar Random	16 (43.24%)	21 (56.7%)	37 (74.0%)		

Table-II. Clinical parameters by gender of diabetics on haemodyalisis
P <0.05 statistically significant

Retinopathy was found in 29(%58%) patients, 18(36%) had diabetic retinopathy,13(72.2%) Proliferative and 5(27.7%) Non- proliferative type. Mean age was 55.89 ± 7.44 years. Patients with hypertensive retinopathy were11(22%) with mean age 56.82 ± 9.5 years. Retinopathy of both type was present in only 2 patients.

Regarding follow up 9(18%) monitored only random sugar levels,10(20%) fasting levels only ,28(56%) both, only 3(6%) did neither. None had follow up with HbA1c levels or urine for protienuria prior to onset of haemodialysis. Lipid profile was available with 9 patients only so excluded from the study. Oral hypoglycemics were used by 27(54%) patients and insulin by 15(30%) pre dialysis and 8(16%) were on no treatment. After onset of dialysis 10(20%) were on oral hypoglycemics, 24(48%) on insulin and 16(32%) required no treatment for diabetes now. Compliance with dietary advice & treatment claimed by 24(48%) and 36(72%) respectively whereas 10 (20%) claimed to have inadequate information, 12 (24%) had financial constraints & 5 (10%) admitted to be careless. History of intake of Hakeem medications was found in 16 (32%) and homeopathic medications in 10 (20%) cases. Table-III presents treatment profile stratified by gender. However no significant difference was found as per gender distribution.

	Male (n)	Female (n)	Total	Chi sq (df=1)	p-value
Oral Hypoglacemic (before onset of dialysis)	16 (59.2%)	11 (40.7%)	27 (54.0%)		
Oral Hypoglacemic (after onset of dialysis)	6 (60.0%)	4 (40.0%)	10 (20%)		
Total	**28**	**22**	**50**		
Insulin (before onset of dialysis)	7 (46.6 %)	8 (53.3%)	15 (30.0%)		
Insulin(after onset of dialysis)	11 (39.28%)	13(59.09%)	24 (48.0%)		
Total	**28**	**22**	**50**		
Hakeem Medication	8 (50.0%)	8(50.0%)	16 (32.0%)		
Homeopathic Medication	6(60.0%)	4(40.0%)	10 (20.0%)	0.01	0.925
Total	**28**	**22**	**50**		
Compliance with diet	12 (50.0%)	12 (50.0%)	24 (48.0%)		
Non Compliance with diet	16 (61.5%)	10 (38.4%)	26 (52.0%)	1.878	0.171
Total	**28**	**22**	**50**		
Compliance with treatment	17 (47.2%)	19 (52.7%)	36 (72%)		
Non- Compliance with treatment	10 (71.4%)	4 (28.5%)	14(28%)	2.38	0.122
Total	**27**	**23**	**50**		
Reasons for non-compliance					
Inadequate information	6 (60.0%)	4 (40.0%)	10 (20.0%)		
Carelessness	2 (40.0%)	3 (60.0%)	5 (10.0%)		
Financial Constraint	7 (58.3%)	5 (41.6%)	12 (24.0%)		

Table-III. Comparison of treatment profile by gender

DISCUSSION

In Southeast Asia prevalence of Diabetes is 7%. The greatest number of people with diabetes are between 40 to 59 years of age[7]. The peak incidence of CKD, 3%/year is usually found in persons who have had diabetes for 10-20 years. The mean age of patients who reach ESRD is about 60 years[8]. Same is apparent in our study with a mean age of 56 years.

Diabetes has become the most common cause of (ESRD) in the U.S. and Europe. In the U.S., diabetic nephropathy accounts for about 40% of new cases of ESRD[9]. Among European countries, in Germany the proportion of patients admitted for renal replacement therapy 59% had DM, out of these 90% had type 2 DM. Our study showed figure of 65.7% which is even higher. Exact prevalence of diabetes in Asia is not readily available. However in Pima Indians with type 2 DM the onset of diabetes at a younger age was associated with higher risk of progression to ESRD. By age 20 years half of these have developed diabetic nephropathy with progress to ESRD[6,8,10]. Male and females are equally effected almost same is shown in our study. The severity and incidence of nephropathy is especially great in blacks than in whites, almost a ratio of 3:1. The relatively high frequency in these genetically disparate populations suggests that socioeconomic factors, such as diet, poor compliance, hyperglycemia, hypertension, dyslipidaemia and obesity have a primary role in the development of diabetic nephropathy[3,5,8,10]. The strongest risk factors are glycemic control and diabetes duration also unmodifiable factors including, age at onset and genetic factors may play a part[9-12]. We have identified similar factors in our patients.

Cigarette smoking has been established as a risk factor for chronic kidney disease(CKD). Klag MJ et al[13] showed a graded increase in the incidence of ESRD by the number of cigarettes smoked in men screened for the MRFIT study. Regalado et al[14] showed in a prospective study of 53 patients with hypertensive nephropathy

that decline in renal function after a mean of 35 month was best predicted by smoking. Haroun et al[15] in their prospective observational study of 20 years duration showed that current smoking is associated with a 2.5 times greater risk of later developing CKD in the population as a whole and when stratified by gender. In our study group 36% reported ever smoking.

Recent data from the ADVANCE trial has demonstrated that more intensive glucose lowering in patients is associated with a 65% reduced risk of end stage renal disease. A target HbA1c level <7% should be considered in order to reduce further renal damage, as long as it can be done safely[16-19]. None of our patient was being followed up with this test prior to onset of dialysis. The measurement of haemoglobin A1c (HbA1c) is central to diabetes care. This is a measure by which healthcare providers can relate blood glucose control to the risk of complications, such as eye damage or kidney failure.

In diabetics the presence and severity of renal impairment is strongly associated with morbidity and the risk of premature death over & above the risk imparted by urinary albumin excretion. Our study patients had no follow up for microalbuminuria[20,21]. Keane WF et al[22] in their RENAAL study proved that level of protienuria is the most important risk for progressive renal injury in diabetic patients with nephropathy.

According to National Health survey of Pakistan the prevalence of DM among population aged more than 25 years is 4.2%[23] while shera AS et al[24,25] have estimated a prevalence of 9.1 to 13.7%. This indicates a diabetic population of 4-8 million. The IDF estimation of year 2013 indicates that by year 2030 Pakistan will have the 10th highest number of people with diabetes with diabetic population of 11.4 million.

Diabetic nephropathy and retinopathy are caused by DM related microangiopathy. The presence and severity of one reflects the other[26]. There is evidence that poor glycemic control measured by HbA1c in association with increased blood pressure is an important risk factor for retinopathy & nephropathy progression. High SBP seemed to account for most of the risk of progression to ESRD. Peralta et[27] al in their study found that this risk started at SBP of 140 mm Hg rather than the currently recommended goal of less than 130 mm Hg, and it was highest among those with SBP of at least 150 mm Hg. In our study group the mean systolic pressure was139.5,range 175-100 and mean diastolic pressure 79.5,range 100-60 mm Hg.

Twenty years after the onset of diabetes nearly all type 1 diabetics and more than 60% of those with type 2 diabetes will have retinopathy. A recent estimate showed 28.5% prevalence of retinopathy among diabetics aged 40 years or older[28,29]. In our study subjects 36%had retinopathy while Kiyani et al[30] in their study in Lahore also showed a prevalence of 33.3%.

On already crumbling economy of our country the huge burden on health resources placed by ESRD needs serious thought and action. By identifying factors contributing towards ESRD we can prevent morbidity & mortality and thus reduce health care cost. Our study population was though urban but less educated belonging mainly to lower and middle social class and still ignorant regarding some intensely important aspects in diabetes management. According to the landmark Diabetes control and complication trial(DCCT) controlling diabetes aggressively and monitoring HbAIC level in the 6-7% range can substantially reduce progression of nephropathy and other microvascular complications . Same is strongly emphasized by KDOQI and reinforced by the 2012 American Diabetes Association Guidelines[31].

The main limitation of this study was its small sample size. The compliance data was based on subjective information given by the patients. Since HbA1c was not monitored precise glycemic control could not be assessed in this group. We recommend larger studies in order to have a more appropriate idea regarding the extent of the contributing factors in our population,

identified in our study. This is high time that aggressive approach is adopted to rectify the problems. Effective measures are required both at the government and public level to aggressively attend to at least the modifiable factors related to prevention and progression of this disease and thus reduce the burden of morbidity associated with this treatable ailment.

CONCLUSIONS

Largest bulk of patients undergoing haemodialysis for ESRD have type 2 DM. Delayed diagnosis, poor compliance with medical advice, treatment & follow up, hypertension, smoking and use of complimentary medicines maybe attributable. Improved diabetes care in terms of educating and counseling patient regarding regular follow up with their physician with monitoring for blood sugar levels, HbAlc & urine for protein ,strict blood pressure control and compliance with medical advice regarding life style modification, and medicines is crucial and mandatory.

Acknowledgment

The authors are thankful to Hamza Latif &Tippu Sultan for their technical assistance in this work.

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