Original Article

Prevalence of primary renal diseases among patients on maintenance haemodialysis: A hospital based study.

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Abstract

Background: *Chronic Kidney Disease (CKD) is the third most common non-communicable disease throughout the world. Studies have shown that kidney patients suffer much from hypertension, diabetes than glomerulonephritis. Many of these CKD patients ultimately terminate to End Stage Renal Disease (ESRD) when life is not sustainable unless hemodialysis is initiated.*
Aim: The aim of this study was to identify primary renal disease leading to ESRD requiring hemodialysis and associated co-morbidities.

Material and methods: *Data was collected purposively from selected six hemodialysis centers. Patients were selected purposively who were available at the time of interview. Data was collected on working days at three shifts After taking informed consent from patients the pre-tested questionnaire was filled up by taking general history, family history, socioeconomic condition, drug history and available records were reviewed for collecting previous biochemical parameters. All entered data were analyzed by using SPSS program version 13.0.*

Result: *Among total 393 subjects, male was 247(63%) and female 146 (37%). Majority were middle aged. Glomerulonephritis were found to be the leading cause of End Stage Renal Disease (ESRD) (50.4%), followed by diabetes in 31.1%, Poly Cystic Kidney Disease (PKD) 5.3%, Renal Stone in 3.7% and rest other. Among the study population hypertension was the most common co morbidity disease (63%) followed by ischemic heart disease and Cerebrovascular accidents.*

Conclusion: *Glomerulonephritis was found to be the leading cause of End Stage Renal Disease (ESRD) and diabetic nephropathy was the second common cause. Hypertension was the most common associated co morbid disease. To evaluate the actual disease pattern a large scale study is required to find the outcome of haemodialysis patients.*

Introduction:

Chronic Kidney Disease (CKD) is one of the most common non communicable diseases through out the world. Studies have shown that kidney patients suffer from glomerulonephritis, hypertension, and diabetes mostly. Now-a day's silent CKD has been proposed as an out break or epidemic by many researcher[1].

According to the data of Bangladesh Renal Registry report almost twenty millions of Bangladeshi adults are suffering from various stages of CKD[2].

Maintenance hemodialysis (MHD) is a treatment to replace kidney function but it does not correct the hormonal functions of the kidney. Therefore, CKD is considered as a devastating endemic[3, 4].

Untreated CKD progresses to End Stage Renal Disease (ESRD) which necessitates Dialysis. Several studies showed closer link of uncontrolled hypertension,

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dyslipidemia and CKD. Chronic kidney disease, as defined by hematuria, proteinuria or decreased estimated glomerular filtration rate (eGFR), affects about 11.6% of the adult population in the United States. CKD frequently occurs in association with diabetes and hypertension, suggesting that vascular disease is a likely cause in many people[1,4].

Although there are various causes of kidney diseases like, diabetes causing diabetic nephropathy, hypertension resulting hypertensive nephropathy. Therefore, estimation of prevalence of etiology in primary kidney diseases patients attending the hemodialyisis varies from country to country. In Bangladesh, there are very few studies conducted regarding the etiological background of Chronic Kidney Disease, with this backdrop this study was conducted among the CKD patients on hemodialysis to determine the proportion of different types of primary cause of CKD[4].

Justification of Study:

Chronic Kidney Disease (CKD) has the highest rate of associated cardiovascular mortality and morbidity with an exceptionally high cost[4]. These findings point to a need for a better definition of CKD to optimize the allocation of healthcare resources and to clarify the nature of the association between Chronic Kidney Disease (CKD) and cardiovascular disease (CVD) This study will look into the causes of CKD and/or ESRD mainly attending the hemodialysis centres[3, 7].

Generic definition of terms:

CKD: Chronic Kidney Disease is defined as kidney damage as confirmed by kidney biopsy or certain markers of damage or a reduction in the (Glomerular Filtration Rate) GFR < 60ml/min/1.73 m2 for three months.

Markers of Kidney damage includes:

Proteinuria, abnormalities on urine dipstick or sediment examination, or abnormal renal imaging[1, 7].

Maintenance hemodialysis(MHD): Is a treatment to replace kidney function but it does not correct the hormonal functions of the kidney[4].

End Stage Renal Disease (ESRD): Untreated Chronic Kidney Disease (CKD) progresses to End Stage Renal Disease (ESRD) which necessitates Dialysis[4].

Hypertension: According to Seven reports of the Joint National Committee(JNC 7) It is defined as systolic blood pressure ⩾ 140 mm Hg and diastolic blood pressure ⩾ 90 mm Hg[4].

Operational definitions:

1. **Glomerulonephritis:** mainly biopsy proven or by urinalysis where hematuria(Blood in urine) > 5 High Power Field / sample and/or proteinuria(Protein in urine) > ++ or Urinary Total Protein > 1 gram per day.
2. **Diabetic nephropathy:** (Fasting Blood Sugar) FBS>7.1 mmol/L, 2 hr.ABF > 11.1 mmol/L with proteinuria > ++ (absent hematuria) or Urinary Total Protein (UTP) > 0.5gram/day or Protein Creatinine Ratio PCR ⩾ 0.5 gram/day or albuminuria >30 milligram/day or ACR ⩾30.
3. **Hypertensive Nephropathy:** elderly > 50 yrs old patient with urinalysis proteinuria <++ (absent hematuria) or Urinary Total Protein (UTP) < 1gram per day.
4. **Obstructive Nephropathy:** Bladder Outlet Obstruction(BOO) i.e, large urinary bladder with significant PVR or evidence of hydronephrosis or lower tract obstruction with urinalysis proteinuria < + (± hematuria/ pyuria) or Urinary Total Protein(UTP) < 1gram per day.
5. **Polycystic Kidney Disease:** Ultrasonogram showing characteristic large cystic both kidneys with urinalysis proteinuria < ++ (± hematuria) or Urinary Total Protein (UTP) < 1gram per day.
6. **Secondary:** lupus nephritis, cortical necrosis, amyloidosis.
7. **Undetermined:** without any definite history, inadequate medical records, anuric (Absence of urine) or nondiabetic.

Objectives of the study:

a) To determine the types of primary diseases leading to End Stage Renal Disease.

b) To determine the association of co morbidities with End Stage Renal Disease.

c) To determine the socio demographic information of the End Stage Renal Disease patients.

Target population :
When patients are in renal failure, then in course of time they develop mild, moderate and severe renal failure. Finally this turns into severe renal failure or End Stage Renal Disease (ESRD). In ESRD life is maintained by haemodialysis. This service is provided by haemodialysis units in specialized hospitals and also at private renal units. Patients take dialysis in these centers 2-3 times weekly in a session of 3-4 hours on average. This study was conducted at six hemodialysis units located in Dhaka

Study Design & period: The study was a cross sectional study conducted between September 2010 to November 2010.

Sample size: Sample size was estimated to be 380 based on the fact that highest prevalence of chronic glomerulonephritis estimated to be around 45% for ESRD (According to Bangladesh Renal Registry report).

Sampling technique and data collection procedure:
By purposive selection six haemodialysis units of Dhaka city were taken for this study. After taking informed consent from patients the pre-tested questionnaire was filled up by taking general history, family history, socioeconomic condition, drug history and available records for collecting previous biochemical parameters.

Inclusion criteria: Maintenance haemodialysis subjects getting hemodialysis through arteriovenous fistula (AVF) in hemodialysis units of selected haemodialysis centers.

Exclusion criteria: a) Patients with history of any recent operations
b) Patients having Acute Renal Failure.

Data analysis: After collection of data, all data were checked for its consistency. Quality control was maintained by editing the data. The data were entered in SPSS programme with coding against each variable.

Ethical consideration: Subjects those gave informed consent was explained regarding the study. Patients' confidentiality was preserved all the times.

Limitation of the Study: " Haemodialysis units were not randomly selected.

The patients on haemodialysis of the centers represent the affluent society of Dhaka

Results:

Table: Distribution of study subjects with their educational status

Educational status	Number (n=393)	Percentage (%)
< SSC	101	25.9
SSC	83	21.3
HSC	89	22.8
Graduate	89	22.8
Masters	25	6.4
Doctoral	03	0.8

Table:2 : Distribution of primary diseases.

Primary disease	Number (n=290)	Percentage (%)
Glomerulonep - hritis(GN)	123	42.4
Diabetic Nephro - pathy (DN)	93	32.1
Polycystic Kidney disease(PKD)	13	4.5
Renal Stone	9	3.1
Hypertension(HTN)	2	0.7
Obstructive uropathy (OU)	2	0.7
Chronic pyelone - phritis (CPN)	2	0.7
Undetermined	46	15.9

Table: 3: Distribution of hemodialysis session among the subjects.

Hemodialysis frequency	Number (n=379)	Percentage (%)
1/wk	7	1.8
2/wk	274	72.3
3/wk	98	25.9

Table: 4 shows, among the study population hypertension was the most common associated disease (63%), and all the rest co morbidities were linked to hypertension.

Table: 4: Co morbidity statuses among patients:

Co diseases	Number (n=363)	Percentage
Hypertension	248	63.1
Hypertension, Ischemic Heart Disease	66	16.8
Hypertension & Cerebro-vascular Disease	18	4.6
Hypertension & Retinopathy	9	2.3
Hypertension, Ischemic Heart Disease & Cerebro-vascular Disease	5	1.3
Hypertension, Ischemic Heart Disease & Retinopathy	4	1.0
Others	14	3.6

Discussion:

In this study 393 patients on maintenance haemodialysis were evaluated. They were selected from six haemodialysis centers of Dhaka city . Majority subjects were middle aged. Primary aim was to identify the etiology of primary renal disease, leading to develop End Stage Renal Disease (ESRD). Which was glomerulonephritis (42%), then diabetic nephropathy (32%) and rest others (Table: 2).

The reported contribution of diabetes ranged from 9.1% in Egypt to 29.9% in Thailand. Hypertensive nephrosclerosis accounted for 13% to 21% of reported End Stage Renal Disease (ESRD). But the range is much wider in other reports, spanning between 4% in the Sudan and 43% in Nigeria[8,9].

Normally patients on maintenance haemodialysis are advised to take three sessions of dialysis per week. In this study around 72% patients took twice weekly dialysis followed by thrice and once per week (Table: 3). .The frequency of lower rate of haemodialysis session taken by the study subjects is a reflection of poor socioeconomic status. According to United Nations International Children's Emergency Fund (UNICEF) 2004, literacy rates are 50% among men, 31% among females. [10]. Present study reveals 50% of patients didn't attend higher secondary classes and less than one percent completed doctoral degree. (Table: 1).

Among the study population hypertension was the most common associated disease (96%), (Table:4) and all the rest co morbidities were ischemic heart disease, cerebrovascular disease and retinopathy linked to hypertension.

Conclusion:

In this study it is found that, majority of the subjects were middle aged, less educated with average income group. Two major causes of end stage renal disease was glomerulonephritis and diabetic nephropathy. Hypertension was the commonest co morbidity among them. Inadequate number of dialysis session was resulted in higher serum creatinine and lower hemoglobin level which could be explained by their average to low economic status.

A larger study with more patient number is needed including bigger number of dialysis centers to identify prevalence of primary renal diseases among haemodialysis population.

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