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# Clinical and etiological profile of Chronic kidney disease patients on hemodialysis in a tertiary care hospital in northern part of Bangladesh

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***Abstract:*** *Background: Chronic Kidney Disease (CKD) is emerging as an important public health problem, not only in developed countries, but also in developing countries including Bangladesh.Objective: To study the clinical and etiological background of patients with CKD on maintenance hemodialysis Method: This cross sectional study was conducted in the Department of Nephrology, Rangpur Medical College Hospital a tertiary level hospital from January 2017 to December 2017 over a period of one year. Ninety six CKD patients above 18 years of age on renal dialysis, and willing to participate in the study were enrolled in this study. Those who did not give informed consent, or had severe cognitive, speech or hearing defect were excluded from this study. Results: In this study, majority of the patients were in age groups 40-59 years. Males () were predominant (59.4% vs 40.6%). Hypertensive nephropathy (60.4%), CGN (36.5%), diabetic nephropathy (24.0%) were the most common etiologies found in this study. Cigarette smoking was prevalent in 18.8%, tobacco chewing 14.6%, NSAID use in 5.2% and alcohol consumption in 1.0% cases. Majority of the patients had Oliguria (72.9%), followed by 61.5% had GI symptoms 40.6% had dyspnea, 38.5% had prurius, 28.1% had volume overload and 12.5% had neuromuscular. Mean hemoglobin was 8.55 ± 2.12g/dl varying within a range of 3.80 g/dl to 12.9 g/dl. Anemia was present in 90.6% and 15.6% had a hemoglobin less than 7g/dl.Conclusions: The most common etiologies of CKD are hypertensive nephropathy, CGN and diabetic nephropathy. Common manifestations are oliguria, GI symptoms, dyspnea and prurius. Smoking is one of the risk factors of CKD.*

***Keywords:*** *CKD, hemodialysis, etiology, manifestation.*

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## I. Introduction

Chronic Kidney Disease (CKD) is determined by the presence of kidney injury and by the level of renal function, assessed according to the glomerular filtration rate. CKD is divided into five stages.[1] Until the fourth stage of the disease, conservative treatment is recommended. End-Stage Renal Disease (ESRD), the most advanced stage, when the kidneys can no longer maintain homeostasis of the body, the patient will depend on dialysis or kidney transplant.[2]

The cause of CKD is unclear in majority of cases, however renal biopsy could help to reach aetiology in most case. The cause of CKD depends on presence or absence of underlying systemic diseases and location of known or presumed pathologic abnormalities (glomerular, tubule-interstitial, vascular or cystic and congenital diseases).[1]

The clinical course is typically a progressive loss of nephron function ultimately leading to end stage renal disease (ESRD) characterized by hypertension, anemia, renal bone disease, nutritional impairment, neuropathy, impaired quality of life and reduced life expectancy ultimately needing some form of renal replacement therapy. This puts a substantial burden on global health resources since all modalities of treatment are expensive.

Chronic Kidney Disease (CKD) is emerging as an important public health problem, not only in developed countries, but also in developing countries.[3] Reasons for rising incidence of CKD are increasing incidence of diabetes and hypertension.[4,5] WHO has identified kidney diseases as 12th and 17th major cause of death and disability worldwide, respectively. [6] This study was conducted to see the clinical and etiological profile of the CKD patients on hemodialysis.

## II. Method

This hospital based cross sectional study was conducted in the Department of Nephrology, Rangpur Medical College Hospital a tertiary level hospital from January 2017 to December 2017 over a period of one year. Ninety six CKD patients above 18 years of age on renal dialysis, and willing to participate in the study were enrolled in this study. Those who did not give informed consent, or had severe cognitive, speech or hearing defect were excluded from this study. Socio-demographic data and clinical data, personal history and laboratory investigations finding were recorded. The data were collected on a pilot-tested structured questionnaire and were compiled & analyzed using SPSS 12.

**Study Design:** Hospital based cross sectional study

**Study Location**: This was a tertiary care teaching hospital based study done in Department of Nephrology, Rangpur Medical College Hospital,Rangpur Bangladesh

**Study Duration:** January 2017 to December 2017

**Sample size: 96** patients.

**Sample size calculation:** The sample size was estimated on the basis of a proportion for infinite population(>10000). For this study, I have calculated sample size with 95 % confidence interval and 10% error. For 50 % prevalence P=0.50,
For 95% confidence level Z = 1.96 and
e= 10% of p =0 .05
Here $n = Z^2 \times p(1-p) /(e)^2$
⇨ $n = 1.96^2 \times 0.5(1-0.5) /(.05)^2$
n = 384
But for time limit only 96 admitted patient during study period was included.

**Subjects & selection method**: The study population was drawn from consecutive CKD patients who admitted to Department of Nephrology, Rangpur Medical College Hospital from January 2017 to December 2017 for dialysis.

**Inclusion criteria:**
1. Either sex
2. Aged ≥ 18 years,
3. Diagnosed cases of CKD

**Exclusion criteria:**
1. Pregnant women;
2. Severe cognitive, speech or hearing defect.
3. Patients taking concurrent corticosteroids, ciclosporin, and/or other chemotherapy.
4. Patients with a history of drug or alcohol abuse.

## III. Result

**Table 1: Age and sex distribution of the study population**

| | Male | Female | Total |
|---|---|---|---|
| 20 - 39 | 19 (19.8) | 15 (15.6) | 34 (35.4) |
| **40 - 59** | **22 (22.9)** | **16 (16.7)** | **38 (39.6)** |
| ≥60 | 16 (16.7) | 8 (8.3) | 20 (25.0) |
| Total | 57 (59.4) | 39 (40.6) | 96 (100.0) |
| Mean±SD | 45.17 ± 15.10 | 44.02 ± 14.93 | 44.70 ± 14.96 |

In this study, majority of the patients were in age groups 40-59 years. Males (59.4%) were predominant than females (40.6%) (Table 1).

**Table 2: Etiological diagnosis of the study population**

| Etiology | Male | Female | Total |
|---|---|---|---|
| CGN | 22 (22.9) | 13 (13.5) | 35 (36.5) |
| Diabetic Nephropathy | 16 (16.7) | 07 (7.3) | 23 (24.0) |
| **Hypertensive nephropathy** | **33 (34.4)** | **25 (26.0)** | **58 (60.4)** |
| Tubulointestitial disease | 01 (1.0) | 1 (1.1) | 2 (2.1) |

| | | | |
|---|---|---|---|
| ADPKD | 01 (1.0) | 1 (1.1) | 2 (2.1) |
| Obstructive uropathy | 2 (2.1) | 0 (0.0) | 2 (2.1) |
| Miscellaneous | 3 (3.1) | 0 (0.0) | 3 (3.1) |
| Unknown | 01 (1.0) | 0 (0.0) | 1 (1.0) |

Hypertensive nephropathy was the most common etiological diagnosis (60.4%) followed by CGN (36.5%), diabetic nephropathy (24.0%), tubulointestitial disease (2.1%), ADPKD (2.1), unknown etiology (2.1%) (Table 2).

**Table 3: Habits in the study population**

| Habit | Frequency (n) | Percentage (%) |
|---|---|---|
| **Smoking** | **18** | **18.8** |
| Tobacco Chewing | 14 | 14.6 |
| Alcohol | 1 | 1.0 |
| NSAID use | 5 | 5.2 |

Cigarette smoking was prevalent in 18.8%, tobacco chewing 14.6%, NSAID use in 5.2% and alcohol consumption in 1.0% cases (Table 3).

**Table 4: Presenting complain in the study population**

| Presenting complain | Frequency (n) | Percentage (%) |
|---|---|---|
| Dyspnea | 39 | 40.6 |
| Volume overload | 27 | 28.1 |
| **Oliguria** | **70** | **72.9** |
| GI symptoms | 59 | 61.5 |
| Neuromuscular | 12 | 12.5 |
| Pruritus | 37 | 38.5 |

In this study, majority of the patients had Oliguria (72.9%), followed by 61.5% had GI symptoms 40.6% had dyspnea, 38.5% had prurius, 28.1% had volume overload and 12.5% had neuromuscular (Table 4).

**Table 5: Laboratory findings of the study population**

| | Mean SD | Min - max |
|---|---|---|
| Hb (gm/dl) | 9.12 ± 2.24 | 3.80 - 12.90 |
| ESR (mm at the end of 1st hour) | 65.29 ± 18.28 | 15.00 - 120.00 |
| TC | 11391 ± 9363 | 4800 – 55000 |
| Neutrophil | 72.55 ± 9.89 | 50.00 - 92.00 |
| Lymphocyte | 21.45 ± 8.84 | 5.00 - 38.00 |
| Monocyte | 2.82 ± 1.77 | 0.00 - 8.00 |
| Eosinophil | 2.88 ± 2.37 | 0.00 - 10.00 |
| Platelet | 177088 ± 140399 | 985 - 690000 |

**Table 5: Level of hemoglobin of study population**

| Hb (g/dl) | Male | Female | Total |
|---|---|---|---|
| >11 | 7 (7.3) | 2 (2.1) | 9 (9.4) |
| **7 – 11** | **40 (41.7)** | **32 (33.3)** | **72 (75.0)** |
| <7 | 10 (10.4) | 5 (5.2) | 15 (15.6) |
| Total | 57 (59.4) | 39 (40.6) | 96 (100.0) |
| Mean±SD | 8.50 ± 2.27 | 8.62 ± 1.93 | 8.55 ± 2.12 |
| Min-max | 3.80 – 12.90 | 4.20 – 11.50 | 3.80 – 12.90 |

In this study, mean hemoglobin was 8.55 ± 2.12g/dl varying within a range of 3.80 g/dl to 12.9 g/dl. Anemia was present in 90.6% and 15.6% had a hemoglobin less than 7g/dl (Table 5).

## IV. Discussion

In this study, males (59.4%) were predominant than females (40.6%) which was concordant with the other studies.[7-10] The prevalence of CKD increases with age.[11] In our study a majority of patients were in the age group of 40-59 years with a mean of 44.70±14.96 years. Modi et al.[10] found mean age was 47 years their study.

Regarding etiology of CKD, hypertensive nephropathy was the most common cause of CKD (60.4%) followed by chronic glomerulonephritis (36.5%) and Diabetic nephropathy (24.0%) were the other common causes of CKD in this study. In 1.0% of the cases, etiology was unknown. Chaudhari et al. [12] found diabetic nephropathy (32.0%), hypertensive nephropathy (20.0%) and chronic glomerulonephritis (10.0%) were the most common etiology of CKD. Sathyan et al.[13] found CGN (51.0%) and diabetic nephropathy (22.0%) as the most

common etiologies of CKD. Jha et al., [14] in their study found that diabetic nephropathy (31.2%) and hypertensive nephropathy (12.8%) were the most common etiologies of CKD. The study of Parsi et al. (2015) revealed that diabetes (40.0%) and hypertension (32.0%) were the most common etiological agent for CKD.

In our study, cigarette smoking was prevalent in 18.8%, tobacco chewing in 14.6%, use of NSAIDS in 5.2% and alcohol consumption in 1.0% which might have contributed to the faster progression of the disease in these patients. Cigarette smoking was prevelant in 32.7%, alcohol consumption in 6.91%, NSAID use in 5.1% and herbominerals in 4.5% cases of CKD patients.[13] Chronic and excessive alcohol consumption (26.0%), smoking (22.0%) and obesity (6.0%) were identified as additional risk factors of CKD. [15]

In our study, oliguria was the most common symptom (61.5%) followed by GI symptoms (61.5%), dyspnea (40.6%), pruritus in 38.5%, symptoms of volume overload in 28.1% cases. Dyspnea (75.68%), symptoms suggestive of volume overload (72.7%) and oliguria (69%) were the chief presenting complaints observed in the study of Sathyan et al. [13].

Chaudhari et al.[12] found that most common system wise manifestations were fluid overload (82.0%), cardiovascular system (76.0%), Musculoskeletal System (74.0%), Gastrointestinal System (70.0%), Respiratory System (32.0%) and Nervous System (22.0%). Li et al.[16] in their study found gastrointestinal system involvement in 81.5% patients.

The mean hemoglobin level in the study was 9.12±2.24g/dl, 90.6% had anemia (cutoff taken as 11g/dl), while 15.6% had a value less than 7g/dl in our study. Hemoglobin levels were below 10 gm/dl in 96.0% of the patients.[12] McGonigle et al. [17] found that up to 90.0% of ESRD patients had hemoglobin less than 10 gm/dl.

The mean hemoglobin in the study of Sathyan et al. [13] was 8.42 g/dl. Anemia was present in 90.3% cases and 25.53% cases had hemoglobin less than 7g/dl. Anaemia was present in all patients where mean hemoglobin level was 7.52 +1.20 mg/dl.[15]

## V. Conclusions

Most common etiologies of CKD patients on hemodialysis are hypertensive nephropathy, CGN and diabetic nephropathy. Anaemia is very common in end stage CKD patients. The most common manifestations are oliguria, GI symptoms, dyspnea and prurius. Smoking is one of the risk factors of CKD.

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