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Socio-demographic and clinical characteristics of CKD patients of northern part of Bangladesh

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Abstract:

Background: *Like other developing countries, in our country major causes of mortality is shifted from communicable to non-communicable diseases. CKD is one of the important NCDS that cause huge mortality and morbidity. If CKD can be diagnosed early progression can be halt or delayed but in developing countries CKD patients usually presented in advanced stage.*

Subjects and methods: *This was a case study carried out among the CKD patients of Dialysis unit of Rangpur Medical College Hospital. Random sampling procedure was used to select the study subjects. On an average about 10 CKD patients newly registered here and a total of 35 CKD patients daily visited the unit for dialysis. Assuming unknown prevalence of CKD in a sample size of 384 was calculated. From the newly registered patient every third patient was taken to generate the sample size of 384.*

Results: *In this study, we have studied a total of 304 CKD patients of both sexes. Male were more than female (66.8% vs 33.2%). Mean age of the study population was 45.37 years. 51% of the CKD*

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patients were smoker but all gave up smoking after diagnosis of CKD. Mean BMI of the CKD patients were 22.23 kg/m2, 2% were obese and 17.1% were overweight. Among the CKD patients 63.12% patients had hypertension, DM and hypertension co-exist in 15.78%. During this study mean duration of CKD was 2.33 years. At the time of diagnosis of CKD mean creatinine was 6.91 mg/dl (range 2-19 mg/dl) and eGFR was 12.86 mL/min (range 2.01-46.18 mL/min). Majority 65.79% of the patients were in stage 5 during diagnosis. First dialysis was initiated on an average 1.36 years (minimum 0-15 years) after diagnosis of CKD. At the time of onset of dialysis serum creatinine was 12 mg/dl (range 6-28.40 mg/dl). After dialysis serum creatinine was 5.98 mg/dl (range 2-17 mg/dl). Majority (77%) of the patient undergone dialysis 2 times/week. Main indication of start of dialysis was high creatinine (12 mg or more) in 97.7% and uremic encephalopathy in 2.3%. In our study 10.52% patient had stroke, among them 4.9% developed stroke after CKD, on the other hand 25.3% patient had IHD and maximum of them 15.8% developed after CKD.

Conclusion: *Majority of the CKD patients were male and from rural area. They presented to the health care facilities in advanced stage. Awareness generation can motivate the CKD patients to seek health care support for early and effective intervention.*

Key words: Organic Manures, Sunflower Cultivar, Seed yield, Nitrogen Uptake

INTRODUCTION

Noncommunicable diseases (such as heart disease, diabetes, or kidney disease) have replaced communicable diseases (such as influence, malaria, or AIDs) as the most common causes of premature death worldwide.[1] These are already a major importance in developed countries and are rapidly becoming a major public health threat in the developing world.[2] An estimated 80% of this burden occurs in low- or middle-income countries, and % is in people younger than 60 years.[1] Like

many other countries, Bangladesh has been experiencing an epidemiological transition from communicable disease to NCDs[3] due to economic 25development and increased level of control and treatment of infectious diseases.[4] Some 51% of deaths in Bangladesh are due to non-communicable diseases and other chronic health conditions.[5] CKD is one of the most important among the NCDs that cause huge mortality and morbidity. According the 2010 Global Burden of Disease study, chronic kidney disease was ranked 27th in the list of causes of total number of deaths worldwide in 1990, but rose to 18th in 2010. This degree of movement up the list was second only to that for HIV and AIDs.[6] 10% of the population worldwide is affected by chronic kidney disease (CKD), and millions die each year because they do not have access to affordable treatment.[7] It is estimated that number of cases of kidney failure will increase disproportionately in developing countries, such as China and India, where the number of elderly people are increasing.[6]

In middle-income countries, treatment with dialysis or kidney transplantation creates a huge financial burden for the majority of the people who need it. In another 112 countries, many people cannot afford treatment at all, resulting in the death of over 1 million people annually from untreated kidney failure.[1] Chronic kidney disease (CKD) is associated with age-related renal function decline accelerated in hypertension, diabetes, obesity and primary renal disorders.[8] Cardiovascular disease (CVD) is the primary cause of morbidity and mortality where CKD is regarded as an accelerator of CVD risk and an independent risk factor for CVD events.[9] In the US, treatment of chronic kidney disease is likely to exceed $48 billion per year. Treatment for kidney failure consumes 6.7% of the total Medicare budget to care for less than 1% of the covered population.[7] The National Institutes of Health have recommended that patients with chronic progressive renal insufficiency be referred to a multidisciplinary pre-dialysis

team in order to minimize patient morbidity and ensure a smooth transition to dialysis therapy. The pre-dialysis clinic is staffed by a multi-disciplinary team, including nephrologists, pre-dialysis nurses, dieticians, and social workers. Components of the pre-dialysis programme include: efforts to delay CKD progression through control of hypertension and hyperglycaemia; patient education regarding CKD, dialysis modalities, and dietary interventions; correction of metabolic abnormalities; insertion of permanent dialysis access; and timely outpatient dialysis initiation.[10] Patients presenting at the later stages of CKD are more likely to have complications requiring emergency interventions and admission. CKD patients in developing countries tend to present with severe disease and with complications. This puts enormous burden on the health system and the few skilled staff working in it. [10] Chronic kidney diseases can be treated. With early diagnosis and treatment, it's possible to slow or stop the progression of kidney disease. In this article we are trying to determine the socio-demographic and clinical characteristics of the CKD patients of dialysis unit of Nephrology department of Rangpur Medical College, Bangladesh.

METHODOLOGY

This was a case study carried out in Dialysis unit of Rangpur Medical College Hospital. This center serves CKD patients at low cost and working enormously to generate awareness of CKD. Till date 55256 patients registered for dialysis in this center. This study was carried out among the CKD patients registered in dialysis unit.

Sampling methods & Sample size

Random sampling procedure was used to select the study subjects. On an average about 10 CKD patients newly

registered here and a total of 35 CKD patients daily visited the unit for dialysis. Assuming unknown prevalence of CKD in a sample size of 384 was calculated to give the true prevalence with a precision of 5% with 95% confidence level. From the newly registered patient every third patient was taken to generate the sample size of 384. A non-medical stuff was engaged in data collection. The stuff was trained in understanding the questionnaire and in data collection.

Data collection

The study purpose and details was described to the patient and informed consent was taken. Socio-demographic data, dietary habit was collected through face to face interview. Blood pressure was measured via mercury sphygmomanometer. Clinical data of the patients was collected from record system. After data collection, data were checked; any incomplete data sheet was found out, by this way we discarded 80 data sheet. Finally we have analyzed of 304 patients.

Statistical analysis

The interested variables was processed, edited and analyzed by SPSS windows version 17.0. The sociodemographic data of the study population were expressed in frequency distribution and their observed difference was tested by one sample't' test and 'chisquare' test. P value <0.05 was considered as statistically significant with the 95% confidence interval. The results were presented in tables.

CRITERIA

Hypertension

Systolic or diastolic blood pressure or both ≥140/90 mm of Hg (according to NICE guideline). Or any individual diagnosed as hypertension and currently taking antihypertensive drugs.

Diabetes mellitus

Fasting blood sugar ≥7 mmol/L and/ or 2 hours after breakfast blood glucose intake ≥11.1 Mmol/L or currently on medications of diabetes mellitus.

Smoker

Those who currently smoke or have smoked tobacco in any form (cigarette, birri etc.) in last 6 months.

Ex-smoker

Ex-smoker who gave up smoking at least 6 months before.

Smokeless Tobacco (SLT)

SLT are raw tobacco leafs taken other than inhalation route (usually taken with betel nut or use in inner aspect of lower lip).

Obesity

BMI level ≥30Kg/M^2 (according to WHO).

Result CKD study

In this study, we have studied a total of 304 CKD patients of both sexes. Male were more than female (66.8% vs 33.2%). Mean age of the study population was 45.37 years. Table 1 shows the socio-demographic characteristics of the study population.

Table 1: Socio-demographic characteristics of the study population (n=304)

Variables	Frequency	Percentage (%)
Mean age	45.37 years (SD 12.68) (age range 18-72 years)	
Sex Male	203	66.8%
Female	101	33.2%
Residence Rural	220	72.4%
Urban	84	27.6%
Level of education		
Illiterate	24	7.90%
<5 class	39	12.80%

5-<10 class	101	33.25%
>10	140	46.05%
Occupation		
Service	48	15.8%
Business	56	18.4%
Agriculture	73	24%
Retired	36	11.8%
Housewife	75	24.9%
Others	16	5.3%
Monthly income		
<5000 taka*	103	33.9%
5001-10000 taka	71	23.4%
>10000 taka	130	42.8%

*1 dollar = 82 taka.

51% of the CKD patients were smoker but all gave up smoking after diagnosis, only 2.3% of the CKD patients used to take SLT. Mean BMI of the CKD patients were 22.23 kg/m2, 2% were obese and 17.1% were overweight. Among the CKD patients 63.12% patients had hypertension, DM and hypertension co-exist in 15.78% (table II). Mean duration of hypertension and DM was 5.67 years. Among the hypertensive only 25% was in regular follow up and follow up blood pressure was controlled in 17.8%. Among the diabetic patient only 11.8% was in regular follow up and blood glucose was controlled in 9.9%.

Table II: Risk factors of CKD

Risk factors	Percentage (frequency)
Hypertension	63.12% (189)
DM	3.94% (12)
Hypertension and DM	15.78% (48)
CGN	1.97% (6)
SLE	0.65% (2)
Obstructive uropathy	0.98% (3)
UTI	4.60% (14)
Renal artery stenosis	3.28% (10)
Interstitial nephritis	0.32% (1)
Drugs	0.98% (3)
Others	5.26% (16)

During this study mean duration of CKD was 2.33 years. At the time of diagnosis of CKD mean creatinine was 6.91 mg/dl (range 2-19 mg/dl) and eGFR was 12.86 mL/min (range 2.01-46.18 mL/min). Majority 65.79% of the patients were in stage 5 during diagnosis.

Stage of CKD	Frequency/percentage
Stage 1 with normal or high GFR (GFR > 90 mL/min)	00
Stage 2 Mild CKD (GFR = 60-89 mL/min)	00
Stage 3A Moderate CKD (GFR = 45-59 mL/min)	02 (0.66%)
Stage 3B Moderate CKD (GFR = 30-44 mL/min)	11 (3.62%)
Stage 4 Severe CKD (GFR = 15-29 mL/min)	91 (29.94%)
Stage 5 End Stage CKD (GFR <15 mL/min)	200 (65.79%)

Mean haemoglobin of the CKD patient was 8.74 gm/dl (minimum 5.60 gm/dl-13.80 gm/dl). Urine albumin analysis demonstrated that 69.1% of the participants had proteinuria, of them 31.3% had "+" proteinuria, 30.6% had "++" and 5.9% had "+++" proteinuria and 50% patient had haematuria in urine. First dialysis was initiated on an average 1.36 years (minimum 0-15 years) after diagnosis of CKD. At the time of onset of dialysis serum creatinine was 12 mg/dl (range 6-28.40 mg/dl). After dialysis serum creatinine was 5.98 mg/dl (range 2-17 mg/dl). Majority (77%) of the patient undergone dialysis 2 times/week. Main indication of start of dialysis was high creatinine (12 mg or more) in 97.7% and uremic encephalopathy in 2.3%. In our study 10.52% patient had stroke, among them 4.9% developed stroke after CKD, on the other hand 25.3% patient had IHD and maximum of them 15.8% developed after CKD.

In this study male was more than female (66.8% vs 33.2%). Similar findings were observed in studies from Spain[11] (60.9% vs. 39.1%) and USA[12] (61.2% vs. 38.8%). The male predominance may be due to the fact that CKD and its risk factors such as hypertension and smoking are commoner in

male than female. Privileges of male in health seeking behaviors might also play a role in the observed differences in CKD prevalence in the two sexes. The mean age of the CKD patients of our study was 45.37 years and 89.80% patients were less than 60 years, which is the economically most active age group. This findings is similar to the findings from Nigeria[13,14] and other developing countries[15,16] but contrasts with that seen in developed countries.[17,18] This may be due to the improved health care facilities in developed countries that allow control of the risk factors of CKD, so less CKD patients in younger age group. There is a high prevalence of infections /infestations and these contribute to the development of chronic glomerulonephritis, which is the leading cause of CKD in developing countries. Additionally, inadequate treatment or control of such causes of CKD as hypertension and diabetes mellitus may also be contributory. The second commonest cause of CKD in the tropics is hypertension. [19] Our study identified hypertension as the commonest risk factor of CKD, followed by combined hypertension and diabetes. Several studies in Ghana[14,15,20] and Nigeria[13] have identified chronic glomerulonephritis and hypertension as the commonest causes of CKD. The same is true in other developing countries.[16] In the developed world, diabetes mellitus is the most common cause of CKD.[18]

In our study 65.79% patient was in stage 5 at presentation and 29.94% patient was in stage 4. Similar findings was observed in study done in other developing countries.[21] This late presentation might be partly due to poor awareness ok CKD among the general population and false belief and perception of the patient regarding management of CKD, they used to treat with the quacks with indigenous medicines. Besides the low detection and treatment/control rates of CKD risk factors like hypertension and diabetes mellitus contributed to late presentation.[14,22] Kidney damage

refers to pathologic abnormalities documented by biopsy or imaging, alterations in urinary sediment or proteinuria (proteinuria/creatinuria > 200 mg/g, albuminuria/creatinuria > 30 mg/g).[23] Besides on the basis of the linear association of albuminuria with progression of CKD, end stage renal disease (ESRD), and all cause of mortality independent of eGRF, albuminuria staging has been added in the 2012 KDIGO guidelines. In our study 69.1% patient had proteinuria at the time of diagnosis of CKD. So, proteiuria may be a cost convenient tool for screening of CKD and also to see the progression of kidney damage. In this study 98.68% of the CKD patients had anaemia, further investigation to determine cause of anaemia was not done. The high prevalence of anaemia is consistent with findings from other African studies.[13,24] Guidelines for hypertension treatment in CKD patients recommend pharmacological therapy and lifestyle modification that will achieve a blood pressure goal of less than 130/80 mmHg.[25] This blood pressure target is often difficult to achieve.[26] In our study blood pressure was control in 17.8% CKD patients. Blood pressure control reduces the rate of cardiovascular disease in CKD patients. Blood pressure control has also been associated with an attenuation of the rate of GFR decline in those with proteinuria. [27]

CONCLUSION AND RECOMMENDATION

Majority of the CKD patients were male and from rural area. They presented to the health care facilities in advanced stage. Awareness generation can motivate the CKD patients to seek health care support for early and effective intervention.

Limitation

Complications and co-morbidity of the CKD patients were not addressed properly.

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