

Awareness of Chronic Kidney Disease in Rural Population of Bangladesh in a District Hospital

*Huda AN,¹ Azim MA,² Haque MS³

Abstract

Chronic kidney disease (CKD) is a growing public health problem worldwide. Awareness about the disease has been documented to lead to early recognition, prompt treatment and halt progression to end-stage renal disease (ESRD). This study was carried out to determine the knowledge of CKD in the rural population attending the outpatient department of medicine and nephrology of 250 bedded district hospital, Kishoregonj. Using a semi-structured questionnaire, the participants were interviewed during their attendance at the outpatient department and scored on 15 items to determine the knowledge of anatomy, physiology, clinical features, treatment and risk factors of CKD. The mean age of participants was 35.1 ± 13.75 years. A large proportion of the respondents (75%) were able to identify correctly the position and some functions of the kidney. The majority (80%) of the respondents have common symptoms associated with CKD, only 30% of them know that swelling is a symptom of kidney disease. 40% respondents knew that habitual use of NSAIDs and 20% respondents knew that herbal medicine are the potential cause of CKD. Overall, 12% of the respondents had good knowledge about CKD. Among the respondents that had good knowledge of CKD 45 (12%) had tertiary education. We confirmed that there is lack of education about CKD in our population. It is recommended that the medical community and the government should take renewed and innovative initiative to increase awareness of CKD among rural population and healthcare providers.

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Key words: Awareness, Chronic kidney disease, Rural population

Introduction

Chronic kidney disease (CKD) is defined as abnormalities of kidney structure or function, present for >3 months, with implications for health.¹ CKD is a common and growing public health problem worldwide.² In most developing countries such as Bangladesh, there is no adequate provision for the health needs for the population and the patients solely bear the financial burden of treatment of chronic medical illness. The majority of persons with

CKD, especially those in the early stage, may be unaware of their disease. It is estimated that 9-12% population in USA have some evidence of kidney damage and/or reduced kidney function.³ With rise in the position as a cause of premature death, and the growing population of kidney disease patients,⁴ attention should be focused on the prevention and early detection of CKD.⁵ A global awareness campaign such as the World Kidney

1. *Dr. Abu Ayub Md. Nazmul Huda, Assistant Professor, Department of Nephrology, Shahid Sayed Nazrul Islam Medical College, Kishoregonj. a2mnhuda71@gmail.com
2. Dr. Md. Arshadul Azim, Assistant Professor, Department of Nephrology, Shahid Sheikh Abu Naser Specialized Hospital, Khulna.
3. Dr. Md. Shariful Haque, Assistant Professor, Department of Nephrology, Shahid M Monsur Ali Medical college, Sirajgonj.

* For correspondence

Day, aimed at raising awareness of importance of the kidneys to overall health of an individual is an important preventive strategy. In Bangladesh various studies have reported the prevalence of CKD to range between 12 to 15%.⁶ However, the absence of renal registries has made it difficult to ascertain the true burden of CKD. Awareness about CKD has been documented to lead to early recognition and prompt treatment;⁷ a move that may eventually reduce healthcare costs and halt progression to ESRD.⁸ The prevalence is likely to continue to rise as risk factors such as diabetes mellitus and hypertension are projected to increase in the coming years in emerging economies.^{9,10} Likewise is the increase incidence of infectious diseases leading to nephropathies, which have also been reported to be high in the developing countries. In a report, renal outpatient attendance represents about one-quarter of all medical outpatient attendance in South-East Nigeria.¹¹ End-stage kidney disease accounts for 4.0-11.0% admissions to medical wards in Tertiary Hospitals.¹¹ The major challenge of CKD patients in developing countries is the late presentation with most patients in an advanced stage. This could have stemmed from a poor level of awareness of the disease as reported by many authors.¹² Worse still, the majority affected are unable to sustain hemodialysis and other adjunctive treatment of end-stage renal disease (ESRD).¹³ Epidemiological studies in developed countries have also shown a low level of awareness of CKD. In the United States (US), the awareness of CKD among people with glomerular filtration rate (GFR) 15-60 ml/min was 24.3%¹⁴ while in Australia, only 2.8% and 8.6% of the population studied were able to cite hypertension and diabetes respectively as risk factors of CKD.¹⁵ In a study among African Americans, only 23.7% knew at least one laboratory test for kidney disease and <3% agreed that CKD is an important health condition.¹⁶ However, awareness of CKD was higher among people with advanced CKD at which level much damage has been

done.¹⁷ Early identification and treatment of CKD will reduce the associated morbidity and mortality,¹⁸ and the significant economic and public health burden. Creating awareness about health risk improves health behaviour,¹⁸ drives the determinants of health impacts positively on effective management of kidney disease.¹⁹ Knowledge of CKD and risk factors increases risk perception and availability for screening to make an early diagnosis.²⁰ Low level of awareness is associated with lower perceived susceptibility to CKD.²¹ In view of these daunting challenges of poor sustainability of treatment, limited health resources and socioeconomic implications of CKD which pervaded resource-poor countries, its prevention through creation of awareness and risk factors would add value to the quality of life and increase productivity.²² There is an immediate need for dissemination of basic CKD information, given the high prevalence of CKD, its risk factors and the low estimated awareness of CKD. Information on awareness of CKD in Bangladesh is scanty to the best of our knowledge and this study is conducted to determine factors associated with respondents' level of CKD awareness and knowledge in order to strategize on preventive modalities using the information gathered from the population.

Methods

This is a descriptive observational study done in 250 bedded district hospital, Kishoregonj for 1 year during the period of January 2018 to December 2018. A total 500 adult (age 16 years and above) patients who attended outpatient department was included in this study. A semi-structured questionnaire was administered to the participants. The healthcare personnel of the hospital were excluded from the study because of their presumed knowledge about CKD. The convenient sampling method was used. The questionnaire was developed based on literature search of past CKD knowledge assessment studies.^{23,24} Informed consent was obtained

from the participants. The participants were interviewed and scored on 15 items drawn from five basic sections as follows; anatomy and function of the kidneys, aetiology of CKD, symptoms and treatment of CKD. Questions were asked about socio-demography and personal health. Each correct answer was scored 1 and incorrect or unanswered questions were scored 0 with a total score of 15. The summation of each participant scores was used to calculate the overall knowledge score as follows; poor knowledge 0-5, some knowledge 6-10 and good knowledge 11-15 scores. The sample size estimation was determined using appropriate formula.²⁵ Kishoregonj is located on south-east side of Bangladesh. Most of people live in village. The people are mainly farmers, civil servants, traders and students. Data obtained was analysed with SPSS (Statistical package for social science) version 16 computer software package. The mean \pm standard deviation (SD) was computed for the quantitative variables. Frequency and percentage was generated for qualitative variables. Comparison between knowledge level and other variables was analysed with independent T-test. A one-way between- groups analysed of variance (ANOVA) was conducted to explore the impact of age on knowledge level of CKD. Subjects were divided into three groups according to their age (group 1-40 years or less; group 2-41 to 60 years and group 3-61 years and above). A p value <0.05 was considered statistically significant.

Results

A total 500 patients of our outpatient department who fulfilled the inclusion criteria were enrolled in our study. The mean age of participants was 35.2 ± 12.35 years. 280 (56%) were married and 255 (51%) were males (Table 1). 280 (56%), 120 (24%) and 20 (0.04%) participants had primary, secondary and tertiary level education respectively (Table 1). The majority of the participants (56%) were in the

age group 41-60 years. 10 (0.02%) respondents reported a family history of CKD.

The majority of the respondents 401 (80.2%) were able to identify the location of kidneys, while 388 (77.6%) knew that an individual had two kidneys. The majority participants 398 (79.6%) were able to identify correctly some functions of the kidney such as excretion of waste products and production of urine. 80.4% participants believed that kidney failure can cause death but only 20.5% knew that CKD is a common disease. Most of the respondents (84.3%) had no idea about common symptoms of CKD and 46.3% participants knew that swelling and reduced urine volume are symptoms of kidney disease. A large proportion of respondents 298 (59.6%) believed that CKD can affect all age groups. 41.1% were of the opinion that CKD is the disease of adults only while about half (56.6%) believed that male and female are affected equally. About 288 (57.6%) respondents knew that habitual and prolonged use of nonsteroidal anti-inflammatory drug (NSAID) pain killer can cause kidney failure, while only 76 (15.2%) believed that herbal medication use can cause kidney failure.

There was a poor knowledge about the various treatment options of CKD. Only 62 (12.4%) and 56 (11.2%) were aware of dialysis and kidney transplantation respectively. Ten (2%) respondents believed that CKD can be treated by traditional method while 55 (11%) respondents believed CKD as non treatable disease.

Overall in our survey, few respondents 84 (16.8%) had good knowledge of CKD while majority 135 (27%) and 281 (56.2%) had some and poor knowledge about CKD respectively (Table II). Among the respondents that had good knowledge about CKD, 14 (2.8%) had tertiary education, while 50 (10%) had secondary education and 15 (3%) had primary education. There was no significant difference

in the mean knowledge score among the respondents who attained tertiary education and others who did not, 1.56 (95% confidence interval, CI:0.79-2.30)

An independent-sample t-test was conducted to compare the knowledge scores for males and females. There was no significant difference in mean scores for males and females 6.66 ± 3.057 versus 6.57 ± 2.79 , $t(495) = 0.25$, $P > 0.05$. There was statistically significant difference in the mean knowledge scores for the three age groups [$F(2,596) = 2.7$, $P = 0.08$].

The poor attitude to routine medical check-up among the respondents was also found in this study as most of participants (60.2%) never checked their blood sugar, while 102 (20.4%)

had their blood pressure checked for the first time during screening work.

About an equal proportion of respondents believed that hypertension (46.6%) and diabetes (48.4%) can cause CKD (Table III). There was a statistically significant difference in the mean knowledge score among the hypertensive and participants who were not hypertensive. [$F(2, 476) = 5.24$, $p = 0.04$]. But only 56 (11.2%) of hypertensive had poor knowledge about CKD (Table IV)

Among the respondents 48.3% occasionally ingest and 15.2% never ingest herbal concoctions. Similarly, about 20.4% of the respondents habitually use NSAID pain reliever.

Table I: Socio-demographic characteristic of the participants

Variables	Number	%
Sex		
Male	255	51
Female	245	49
Age groups in years		
16 – 40	130	26
41 – 60	280	56
>60	90	18
Educational Level		
No formal education	80	16
Primary	280	56
Secondary	120	24
Tertiary	20	4
Marital status		
Single	110	22
Married	280	56
Widow/er	90	18
Separated	20	4

Table II : Level of awareness and educational level among the participants

Educational level	Awareness level			Total
	Poor n(%)	Some n(%)	Good n(%)	
No formal education	55(11%)	20(4%)	5(1%)	80(16%)
Primary school	215(43%)	50(10%)	15(3%)	280(56%)
Secondary school	10(2%)	60(12%)	50(10%)	120(24%)
Tertiary education	1(0.2%)	5(1%)	14(2.8%)	20(4%)

Table III: Participants level of awareness of chronic kidney disease

Variable	Correct answer	Wrong answer
Where is the kidney located?	401(80.2%)	99(19.8%)
How many kidneys in a normal individual has?	388(77.6%)	112(22.4%)
Do you know that abuse of pain reliever (NSAID can cause kidney failure)?	288(57.6%)	212(42.4%)
Do you know that herbal medicine can cause kidney failure?	76(15.2%)	424(84.8%)
Do you know that diabetes mellitus can cause kidney failure?	283(56.6%)	217(43.4%)
Do you know that high blood pressure can cause kidney failure?	242(48.4%)	258(51.6%)
Do you think that kidney disease is an important medical problem?	401(80.2%)	99(19.8%)
Do you think that kidney disease is preventable?	120(24%)	380(76%)
Do you know that dialysis is a treatment of kidney failure?	62(12.4%)	438(87.6%)
Do you know that transplantation is a treatment of kidney failure?	56(11.2%)	444(88.8%)

Table IV: CKD awareness in hypertensive, normotensive, diabetic and non-diabetic participants

Status of participants	Awareness level			Total
	Poor n(%)	Some n(%)	Good n(%)	
Hypertensive	56(11.2%)	60(12%)	89(17.8%)	205
Normotensive	165(33%)	90(18%)	40(8%)	295
Diabetic	21(4.2%)	29(5.8%)	70(14%)	120
Non-diabetic	251(50.2%)	89(17.8%)	40(8%)	380

Discussion

This study demonstrated that the awareness of CKD in rural community of Bangladesh is very low, as only 12% of our participants had good knowledge of kidney disease. Less than half of the participants believed that kidney disease is common and an important medical problem. More than 70% of our participants did not know common symptoms of CKD or the causes of CKD. This finding is consistent with the result of a study by Ayuokunle et al²⁶ where more than 75% of their participants did not know the common symptoms of kidney disease. Chow et al²⁴ found that 53.3% of their participants could not correctly identify the risk factors for development of CKD which is also consistent with our study as we found 61.2% of

our participants could not identify the risk factors of CKD.

Common environmental factors causing chronic kidney disease such as repeated infections, habitual ingestions of herbal medicines and NSAID were least mentioned by our participants.²⁸ Finding from the work by Okaka E²⁷ and Alebiosu CO²⁹ have shown the consistent poor knowledge about causes of CKD among the general population.

A study carried out in Australia among diabetic patients showed that few identified diabetes (8.6%) and hypertension (2.8%) as risk factors for development of kidney disease in response to an open-ended questions on risk

factors.³⁰ Okaka EI and Ojogwu LI²⁷ poor awareness of kidney disease among non-medical students in Benin City Nigeria where 25% knew of the association between kidney disease and hypertension where 44% of respondents were aware that diabetes mellitus is a cause of kidney disease, this is comparable to 48.4% and 56.6% in hypertension and diabetes mellitus respectively obtained in our study.

While exploring the impact of education on the knowledge of chronic medical illness, we found that majority of participants (70%) with tertiary education had good knowledge of CKD. This result is similar to the finding of Chow et al²⁴ who demonstrated the relevance of education in the knowledge of CKD. Tuot et al³¹ also showed that low income and low level of formal education were independently associated with low CKD awareness. It is assumed that an educated individual will be better informed, health literate, will be more attentive to the presence of disease and practice preventive behaviours as compared with less educated persons. Fezeu et al³² demonstrated that educational level has a direct influence on the extent of knowledge of chronic medical disease such as diabetes. Reports from other studies have equally shown the importance of education among other factors in the awareness of chronic medical disorder.^{33,34} A survey by Ayotte et al³⁵ on knowledge of hypertension among American general population showed that ethnicity, gender and education level were associated with knowledge levels. However, Plantinga et al. found no relationship between the level of education and awareness of CKD.¹⁷

A family history of CKD is expected to increase individual's knowledge about kidney disease and their desire to get tested¹⁶, we found the awareness among respondents with family history of CKD is good.

Hypertension and diabetes mellitus are strong risk factors for development of CKD.³⁶ We

found a poor attitude to regular medical check-up among the respondents (69%) generally but more worrisome among hypertensive and diabetic individuals. Few (17.8%) among hypertensive respondents have good level of knowledge about the association between high blood pressure and CKD, while less than two third of them had blood pressure checked in the previous six months. These are high-risk individuals with a likelihood of poor compliance of with antihypertensive medications. This finding is similar with previous reports by Petrella et al³⁷ where hypertensive patients were found to be unaware of the association of high blood pressure and CKD. In addition, they were found to have poor knowledge of lifestyle measures in the control of hypertension. Similarly, the report of a survey among hypertensive patients by Boulware et al showed that few (20%) felt "very likely" to develop CKD and one-third (33%) were "very concerned" about developing CKD.²¹

The use of and exposure to nephrotoxins such as herbal preparations and habitual ingestion of NSAID were found to be common among the respondents. Undefined mixtures of herbal concoctions and heavy metals are particularly toxic to the kidney. The use of such nephrotoxic herbs are common in our environment and can present with various forms of renal dysfunction.^{38,39,40}

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