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Risk factors for chronic kidney disease: a hospital based cross sectional study from Visakhapatnam

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ABSTRACT

Background: Chronic kidney disease (CKD) is being increasingly recognised as a leading public health problem. In India, given its population >1 billion, the rising incidence of CKD is likely to pose major problems for both healthcare and the economy in future years. Diabetes and hypertension are strong predictors for development and progression of chronic kidney disease. The objective of the study was to assess risk factors for chronic kidney disease among patients undergoing dialysis in King George Hospital (KGH), Visakhapatnam.

Methods: This is an observational descriptive cross sectional study done in dialysis unit in KGH. A total of 100 patients were selected out of 141 registered CKD patients by simple random sampling technique. Study is done in the month of October- November 2015. A pretested semi structured schedule was administered. Informed written consent was taken from the patients. MS excel 2007 was used for data entry. Data was analysed by SPSS trial version 20. Categorical data was analysed by Chi square test.

Results: Among 100 study subjects 72 were females and 28 were males. 91% of the CKD patients were Hypertensive, among whom 73.6% were males and 26.4% were females. This difference was not found to be statistically significant (p=0.446). 22% of the CKD patients were Diabetic, among whom 81.8% were males and 18.2% were females.

Conclusions: Better understanding of the role of risk factors in CKD is needed. Large community based cross sectional studies are needed to study in detail about CKD risk factors.

Keywords: Chronic kidney disease, Risk factors, Diabetes, Hypertension, Visakhapatnam

INTRODUCTION

Chronic kidney disease (CKD) is an important public health problem. CKD is defined as structural and/or functional damage to the kidney or a glomerular filtration rate (GFR) of <60 mL/min/1.73 m², for three months or more, irrespective of cause. Low- and middle-income countries have seen an alarming rise in CKD over the past 20 years.

According to the registries of different countries, CKD affects 10–16% of adults around the world.³ CKD has

become a serious public health issue. There are currently over 1.4 million patients receiving renal replacement therapy worldwide. An uncontrolled diabetic and/or hypertensive patient can easily and quickly progress to an end-stage kidney disease patient. Exposure to excessive alcohol consumption, smoking, and the use of analgesic medications also constitute risks.⁴

There are few well-established risk factors for end-stage kidney disease. Diabetes and hypertension are strong predictors for the development and progression of chronic kidney disease.^{5,6} Hypertension is both an

important cause and consequence of CKD. Evidence from numerous clinical trials has demonstrated the benefit of blood pressure control.7

Identification of factors predisposing an individual to CKD is essential in terms of personal and community health, as some risk factors can be modified and can prevent or slow down progression to ESRD.8 Family members of CKD patients have a high prevalence of CKD and its risk factors. Hence, it is advised to screen the high-risk family members of those with CKD, in an attempt to prevent any kidney disease.

Smoking can increase the CKD risk through proinflammatory state, oxidative stress, prothrombotic shift, endothelial dysfunction, glomerulosclerosis and tubular atrophy. 10 Diabetes mellitus (DM) is the leading cause of CKD and ESRD in both developed and developing countries. 11 Systemic hypertension is transmitted to intraglomerular capillary pressure leading to glomerulosclerosis and loss of kidney function; thus variable risk of impaired renal function has been reported among hypertensive subjects. 12 The main objective of the study is to assess risk factors for Chronic Kidney Disease among patients undergoing dialysis.

METHODS

A descriptive cross sectional study conducted among a sample of 100 CKD patients undergoing dialysis in Dialysis unit in King George Hospital, Visakhapatnam. Study period was October – November months 2015.

During this study period, a total of 141 CKD patients were registered and among them 100 patients were selected by simple random sampling technique. Selection criteria were chronic kidney patients undergoing dialysis and who were willing to participate in the study, till the sample size is reached.

A pretested semi structured schedule was administered and data was collected. Informed consent was taken from the study subjects.

Operational definitions of variables in the study

CKD is defined as glomerular filtration rate (GFR) <60 mL/min/1.73 m² for >3 months. Participants were considered to have diabetes mellitus if previously they had been recognized by the doctor as having DM or any documents in favour of DM or they reported taking insulin or oral antidiabetic drug or random plasma glucose ≥11.1 mmol/Lsi with symptom. Hypertension was defined as systolic BP ≥140 mmHg or diastolic BP ≥90 mmHg or use of medication for hypertension irrespective of the blood pressure.¹³

Smoker: The person who reported smoking any form of tobacco products like cigarettes, cigars, pipes etc. in the previous year.

Consumption of alcohol: The person who consumed alcohol in previous twelve Months was assumed to have alcohol use.

Body mass index (BMI): In the study, the participants were classified based on WHO international Classification for BMI (as per WHO STEP protocol).¹⁴

Family history of chronic kidney disease: Any member of the family i.e. mother, father and siblings who were diagnosed with chronic kidney disease.

Permission: Permission was taken from Head of the Department of nephrology.

Data analysis

MS Excel 2007 was used for data entry. Data was analysed by SPSS trial version 20. Categorical data was analysed by Chi square test.

RESULTS

Among the study subjects seventy two (72) were females and twenty eight (28) were males. In our study peak age incidence among both genders was found to be 41-60 years (Figure 1). Mean age of study subjects was calculated and which was as follows, Mean age of study subjects was 47.94±12.25. Mean age among males was 49.62±12.73. Mean age among females 46.25±10.75.

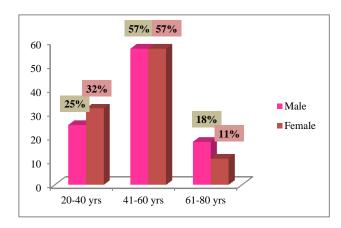


Figure 1: Age and gender wise distribution of CKD patients.

Table 1 shows socio demographic details of study subjects. Majority of the study subjects i.e 62% were residing in rural areas, 35% were in urban areas and 3% were residing in tribal areas. 92% of the study subjects were Hindus by religion and were married. Education status was also obtained from them which is as follows: 53% were illiterates, 38% of study subjects studied up to class 10, 3% of the study subjects studied up to intermediate and 6% of the study subjects studied degree and above.

Table 1: Socio demographic details of study subjects.

Socio demographic details	Number (n=100)
Residence	
Rural	62
Urban	35
Tribal	3
Religion	
Hindus	92
Muslims	1
Christians	7
Marital status	
Married	92
Unmarried	8
Education	
Illiterate	53
Up to class 10	38
Intermediate	3
Degree and above	6
Occupation	
Skilled	28
Unskilled	56
Not working	16

Twenty eight (28%) of the study subjects were graded as skilled workers 56% were graded as unskilled workers and 16% were not involved in any occupation.

The study subjects were classified based on updated B G Prasad's classification 2016 and found that 10% were lower class, 49% were lower middle class, 30% were middle class, 10% were upper middle class and remaining were upper class.

Table 2: Distribution of study subjects based on diabetes and hypertension.

Risk factors	Males (%)	Females (%)	Total
Hypertension			
Yes	67 (73.6)	24 (26.4)	91
No	5 (55.5)	4 (44.5)	9
Diabetes			
Yes	18 (81.8)	4 (18.2)	22
No	54 (69.2)	24 (30.8)	78

Table 2 shows that 91% of the CKD patients were Hypertensive, among whom 73.6% were males and 26.4% were females. This difference was not found to be statistically significant (p=0.446). 22% of the CKD patients were diabetic, among whom 81.8% were males and 18.2% were females. This difference was not found to be statistically significant (p=0.372).

There are also other risk factors like smoking, alcoholism, family history of CKD and analgesic abuse as shown in Figure 2. Smoking is seen among 44% of

study subjects. History of alcohol consumption is seen among 50% of study subjects. Analgesic abuse is seen among 36% of study subjects. Family history of chronic kidney disease is seen among 6% of study subjects.

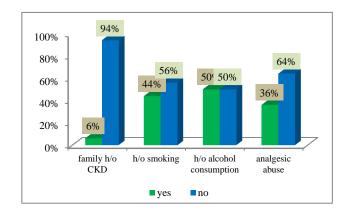


Figure 2: Distribution of risk factors among study subjects.

Table 3: Distribution of BMI among study subjects.

BMI/gender	Number (%)
<18.5	61
18.6-24.99	30
>25	9

41-60 years age group had the highest percentage of common risk factors as compared to other age groups. Low BMI is seen among 61% study subjects, normal BMI is seen among 30% study subjects and 9% study subjects were having high BMI. Mean BMI of study subjects is found to be 21.67 (Table 3). Pesticide exposure was seen among 36% of the study subjects.

DISCUSSION

Our study indicates that 62% were residing in rural areas. 53% of the study subjects were illiterates. The results of this study found that hypertension and diabetes are the most common risk factors. This finding is similar to the finding in SEEK study done in India. MRFIT study also found that higher blood pressure is associated with higher incidence of end stage renal disease. 5,6 With rising prevalence of these risk factors in India, prevalence of CKD is expected to rise.

According to the result of another study, diabetic nephropathy and hypertensive nephrosclerosis were the most common causes of ESRD, or diabetes mellitus and hypertension are the leading causes of chronic kidney disease.¹⁵

In Huda et al study the role of smoking as a risk factor for kidney disease is being increasingly recognized and also diabetes mellitus and hypertension were present in significant proportions in CKD population. In a recently published screening and early evaluation of kidney disease study the mean age of the population was 45.22 ± 15.2 years, which is similar to the mean age of this study (47.94 ± 12.25) . ¹⁶

Family history of CKD was found in 21.6% of participants, in our study family history of chronic kidney disease is seen in 6% of study subjects.¹⁷

CONCLUSION

To conclude CKD risk factors were similar to those reported in earlier studies. Hypertension, diabetes, smoking, alcoholism, family h/o CKD and analgesic abuse are the significant risk factors associated with chronic kidney disease. It should be stressed to all primary care physicians taking care of hypertensive and diabetic patients to screen for early kidney damage. Early intervention may retard the progression of kidney disease. Increasing our understanding of risk factors for the occurrence and progression of CKD poses substantial challenges.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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