

To Assess and Evaluate the Risk Factors Associated With Chronic Kidney Diseases in Karachi, Pakistan. A cross sectional study

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ABSTRACT

Aim: To find out the prevalence and risk factors associated with chronic kidney disease in Karachi Pakistan.

Method: The type of study is cross sectional study and it took place in Karachi Pakistan, from January 2014 to May 2015. Data was collected from through screening tests which were done in camps at different places in the city. Chronic kidney disease epidemiology collaboration equation was used to calculate the GFR (glomerular filtration rate) and also serum creatinine levels were checked through a standardize blood test.

Results: Out of the study population of n=270 patients. Chronic Kidney Disease was found in n=69 (25.55%) of the subjects under study. A significant relationship was found between the disease and Diabetes Mellitus and Hypertension (p=0.006). There was also a significant relationship between Hypertension and Diabetes with mean Glomerular Filtration Rate (p<0.001).

Conclusion: According to our study the burden of chronic kidney disease is very high as compared to other countries, and its implications on morbidity and mortality, in addition to the economical burden is significant, hence prompting the need for early diagnosis and management of the condition.

Keywords: Glomerular filtration rate, Chronic kidney disease, GFR, serum creatinine levels, cross sectional study, End stage renal disease.

INTRODUCTION

The definition of chronic kidney disease, is a progression in loss of kidney function¹. Currently the lack in early diagnosis through screening, late management and lack of prevention from disease, which ultimately results in end stage renal disease requiring either transplant or life long dialysis in addition to other systemic manifestations, pose a serious economic burden on Pakistan's health care system². Many studies have been carried out trying to figure out the preventable factors, that can essentially lead to various methods of prevention of chronic kidney disease^{4,5}. For a country like Pakistan this issue of chronic kidney disease burden is of prime importance, and that effect our study is directed towards finding out the prevalence and associated risk factors of chronic kidney disease in a large metropolitan city like Karachi.

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METHODS

The type of study is cross sectional study and it took place in Karachi Pakistan, from January 2014 to May 2015. Data was collected from through screening tests which were done in camps at different places in the city for the general population. Flyers and volunteers helped spread awareness and provided information to the people who visited the camps. The population under study comprised of adults aged 30 years and above and people who are octogenarian, those with established chronic kidney disease, and known cases of hypertension and diabetes mellitus were excluded from the study. Blood pressure readings of patients were taken and two readings of greater than 140mmHg for systolic and greater than 90mmHg for diastolic were considered to be hypertensive. HbA1c of greater than 6.5% was considered diagnostic of Diabetes^{7,8}. In our region the prevalence of estimated glomerular filtration rate (eGFR) is 15 to 20%, using an estimated population of 25%, a precision of 0.05 with a confidence interval of 95%, the sample size was calculated to be 270 Patients. CKD epidemiology collaboration equation was used to calculate eGFR using the serum creatinine value that was checked for all subjects. According to the National Kidney Foundation Kidney Disease Outcomes Quality Initiative (KDOQI) the CKD was divided in to two stages¹¹. Means and standard deviations were calculated for continuous

variables. Categorical variables were calculated using frequencies and percentages. Chi square test was used to find out the relationship between CKD and clinical factors. Association between CKD and other co-morbidities was assessed by organizing the data according to age and gender, and to assess the association between eGFR and age, the data was organized according to gender and co-morbidities. Sample t-test was used to assess the difference in means. Universal analysis was used to compare CKD with non CKD variables. Analysis of data was done on SPSS 20, and p values were considered significant when <0.05

RESULTS

The patient population under study consisted of $n=270$ patients of them 175(65%) of them were males and 95(35%) were females. The median age was 47. Serum creatinine checked was checked for all the patients and those who refused for blood sampling were not included in the study. Among them, 201(74.4%) had GFR >90 , 57(21.1%) were in second stage of CKD with an eGFR 60-89, and 12(4.55%) in stage 3 of CKD with an eGFR 30-59 (Table-1).

Table1: Prevalence of chronic kidney disease.

	n	%age
GFR > 90	201	74.4
2 nd stage CKD eGFR = 60-89	57	21.1
3 rd stage CKD eGFR = 30-59	12	4.55

Number of patients who had diabetes 56(20.74%) ($p=0.015$) and 70(25.92%) are those who had hypertension ($p=0.021$). Mean eGFR in patients diagnosed with Diabetes Mellitus was 96.4 compared with 105.5 in non-diabetics ($p=0.002$). Furthermore hypertensive patients had a lower eGFR compared to non-hypertensive's (100 vs 105; $p=0.029$). A negative correlation was found between age and eGFR while accounting for other variables, race and comorbidities ($r=-0.45$; $p<0.001$).

Table 2: Characteristics of Patients.

	GFR > 90	CKD stage 2-3	P-value
Number	201	69	
Mean age	45.2 (SD=11.1)	55.3(SD 12.66)	0.000
Hypertension	45(22.5%)	25(36%)	0.021
Diabetes Mellitus	35(17.5%)	21(31.9%)	0.015

DISCUSSION

According to our study the chronic kidney disease prevalence is high in Karachi. Diabetes Mellitus and

hypertension prevalence is also very high and this adds to the risk factors for CKD. Most patients were unaware of their condition and were taking no medications, which rings an alarm for the need of early screening of the patient population. CKD is a global epidemic¹², In china its prevalence is 5.09%¹³. In under developed countries it is often not diagnosed and no intervention is done¹⁴ which may lead to end stage renal disease, and thus requiring transplant and dialysis¹⁴. In Pakistan access to these treatments are limited due to the economic dearth and lack of expertise and equipments^{15,16,17}. It is of supreme importance to dedicate efforts towards prevention of ESRD, by adopting ways to delay progression of chronic kidney disease¹⁸. In Pakistan there is lack of data from large scale surveys, to assess the prevalence of CKD in asymptomatic population, According to our survey the expectant CKD prevalence is much higher when compared to prevalence from countries like China, United States of America and India^{19,21}. CKD is a big health problem, and its significant association with hypertension and diabetes mellitus, shows two preventable risk factors. Most patients with this condition will eventually develop ESRD and various metabolic illnesses²². Hence making CKD a major burden on country's economy. In countries like Brazil, Cuba and Bolivia evidence based health care policies have shown to decrease the burden of chronic kidney disease^{23,24,25}. A country like Pakistan can benefit from such practices. We should lay more emphasis on nipping in the bud the chronic kidney disease before it takes full effect as ESRD. An accurate estimation of the burden of CKD in Pakistan is still needed, for the computation of efficient health care policies, to recognize the high and low risk regions and allocation of resources accordingly. Multicentre surveys along with early disease identification and risk stratification with mass screening campaigns are the need of the hour for Pakistan. Also controlling of DM and HTN are also of prime importance for delay of progression of CKD. Our study still has some limitations, since we did not check urine analysis of the patients a lot of patients with stage 1 CKD might have been missed. We also were able to recognize patients with stage 2 CKD with accuracy, hence the calculated prevalence in our study is actually underestimated by a large margin. Also since this is a cross sectional study, we were unable to establish accurately a causal relationship between diseases like HTN and DM with CKD. Many factors such as patient fatigue and appetite, dehydration status might have affected blood pressure and creatinine readings.

Finally it is of supreme importance for other studies like ours to be carried out for the preparation

of effective health care policies to get CKD under control for a burgeoning economy like Pakistan.

CONCLUSION

According to our study the burden of chronic kidney disease is very high as compared to other countries, and its implications on morbidity and mortality, in addition to the economical burden is significant, hence prompting the need for early diagnosis and management of the condition.

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