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Orignal Article

Pervasiveness and Determinants of Assessment of Chronic Kidney Disease in Pakistani Population: A 2-years Cross-Sectional Study

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ABSTRACT

Chronic Kidney Disease (CKD) is a disease in which kidney is impaired and cannot filter the blood in proper way **Objective:** To assess the prevalence of chronic kidney disease in the least accessed and underdeveloped areas of Pakistan **Methods:** The area of study was Bahawalpur Victoria Hospital (BVH), Bahawalpur. All statistical parameters were calculated with the help of MS Office 360, GraphPad Prism 8, and SPSS 21. **Results:** The most vulnerable locales were hinterland and underdeveloped regions. When we demarcate our studies putting focus on the gender, we found that male gender was more susceptible to the disease than the female one. Quinquagenarians were found to be among those most affected. Whereas octogenarians were among those with the least affected ratio. **Conclusion: Since r**ural areas being the ones most affected, there is dire need to enhance the gambit of research to a higher level.

INTRODUCTION

Chronic kidney disease (CKD) is becoming a serious health issue worldwide –. CKD is characterized by a gradual loss of kidney function, albuminuria, kidney malfunctioning or a lessened glomerular filtration rate (GFR). The pervasiveness of the CKD is diagnosed by constant proteinuria . CKD is an umbrella term for miscellaneous disorders affecting the structure and function of nephrons . Vascular diseases such as bilateral renal artery sclerosis, hemolytic-uremic syndrome and vasculitis can also cause renal failure. Some glomerular diseases and congenital diseases which include focal segmental glomerulosclerosis, IgA nephropathy, diabetic nephropathy, lupus nephritis and polycystic kidney disease can engender CKD, other causes are reflux nephropathy, benign prostatic hyperplasia, pinworm infections and Mesoamerican nephropathy –. CKD remains asymptomatic at initial stages, but still can be diagnosed by elevated serum creatinine and proteinuria . Prevalence of CKD is 12.5% (11.4 – 13.8%) approximately worldwide . Africans, Spanish Americans, Americans, and South Asians, including Pakistanis, east Pakistanis, Indians and Sri Lankans, are more prone to CKD as compared to other populations –. Centers for Disease Control and Prevention (CDC) reported that CKD affected an estimated 16.8% of U.S. adults aged 20 years and older in the period from 1999 to 2004 .

METHODS

The current study was observational, cross-sectional, centered on single place i.e. kidney center Bahawal Victoria hospital, Bahawalpur. Interview and discussion sessions were used in the study for patient record about information collection. 471 randomly selected patients were enrolled in the study in a duration of 2 years. Serum was collected from

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the blood samples. These samples were sent for analysis to the Bahawal Victoria Hospital Pathological Lab. All reports were collected in duplicate. One copy of the report was retained by the researcher and the other was handed over to the patients. From these reports, electrolyte abnormalities were calculated according to "investigations operations manual 2015". The estimated Glomerular Filtration Rate (eGFR) by using serum creatinine concentrations was calculated through modification of diet in renal disease (MDRD) equation. Beckman Coulter AU680 was used for estimation of Creatinine in serum of the clinical samples.

GFR (ml/min per 1.73 m^2) = $175\times[\text{serum Cr (mg/dl)}]^{-1.154}\times[\text{age}]^{0.203}\times[0.742 \text{ if female}]$.

The patients were included in the study who were of age ranging from 20-80 years, signed the written consent form or gave verbal consent in case of illiterate patients, patients with CKD stages from 1-5, receiving dialysis treatment, both rural and urban population, both genders i.e., male and female. Those patients who were excluded from the study were of age under 20 and above 80 years, had received organ transplantation, with liver diseases, and presenting congenital kidney defects. Following categories of the patients were also excluded from the research study i.e kidney donors, patients with carcinoma, and women with recent history of conception. The fundamental/standard protocol was approved by the ethical committee of Department of Pharmacy, The Islamia University of Bahawalpur. Patients were briefed about the study purpose and privacy of their data. It was told to them that all information provided will be treated strictly as confidential and purely for research purposes. Student F-test and t-Tests were done on MS-Excel. Moreover, GraphPad Prism-8 and IBM SPSS 20 were also used for computation of the data.

RESULTS

A total of 471 patients were included in the current study. Male count was 275(58.3%). Among them 79(28.7%) belonged to urban area while 196(71.3%) were from rural origin. Out of 471 patients 196(41.6%) of them were women as in table 2. 61(31.1%) were urban women, 135(68.8%) rural women.

CKD assessment

a. CKD in females

Measurable examination of vulnerability to CKD showed that most noteworthy sickness rate was in women of age 30-40(27.6%). The age group 70-80 was least in positioning in the illness status(4.6%)as given in table 1.

b. CKD in males

Statistical analysis was carried out to assess the vulnerability to CKD, it was revealed that the men of age group 50-60 (24.3%) were at highest risk. The age group 40-50 was the second highest in ranking in the disease status (14%). To assess the statistical difference in prevalence of CKD between the urban and rural areas, F-test and t-Test were applied as given in table 2. It was observed that there was a significant difference between urban and rural male strata about prevalence status of CKD (p=0.0154).

Stage wise

Patients' serum creatinine measurements were taken and eGFR was calculated (Figure 1-4). Above the age 50 years the rural women and 30 years rural men were almost in CKD stage 5. There was an enormous distinction in urban women and rural women control status of CKD(p=0.0381).

Age categories	All	Urban	rural	P-value
	n(%)	n(%)	n(%)	
20-30	29(14.9)	8(27.6)	21(72.4)	0.0381
30-40	54(27.6)	11(20.4)	43(79.6)	
40-50	47(23.9)	17(36.2)	30(63.8)	
50-60	37(18.8)	13(35.1)	24(64.9)	
60-70	20(10.2)	9(45)	11(55)	
70-80	9(4.6)	3(33.3)	6(66.7)	

Table 1: Characteristics of female strata

Age categories	All	Urban	rural	P-value
	n(%)	n(%)	n(%)	
20-30	43(15.6)	16(37.2)	27(62.8)	0.0154
30-40	30(10.9)	14(46.7)	16(53.3)	
40-50	66(24)	16(24.2)	50(75.8)	
50-60	67(24.3)	15(22.4)	52(77.6)	
60-70	43(15.6)	9(20.9)	34(79.1)	
70-80	26(9.4)	9(34.6)	17(65.4)	

Table 1: Characteristics of male strata

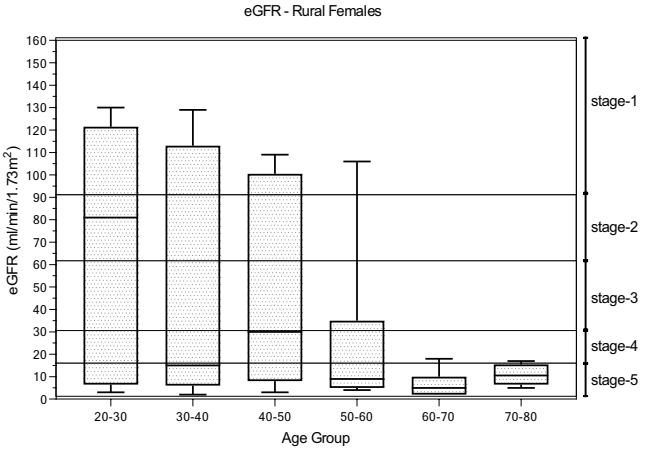

Figure 1: eGFR of rural females

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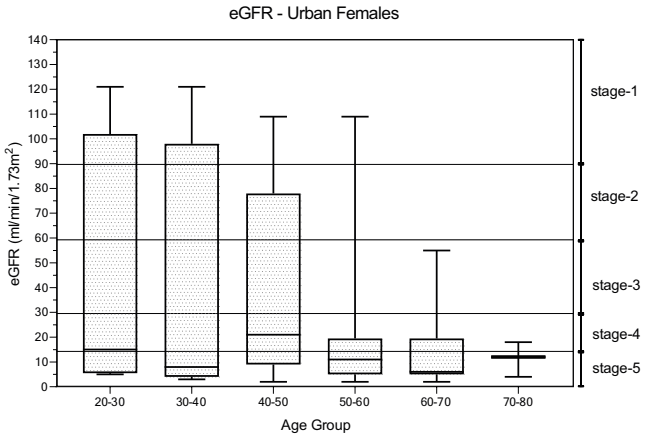

Figure 2: eGFR of urban females

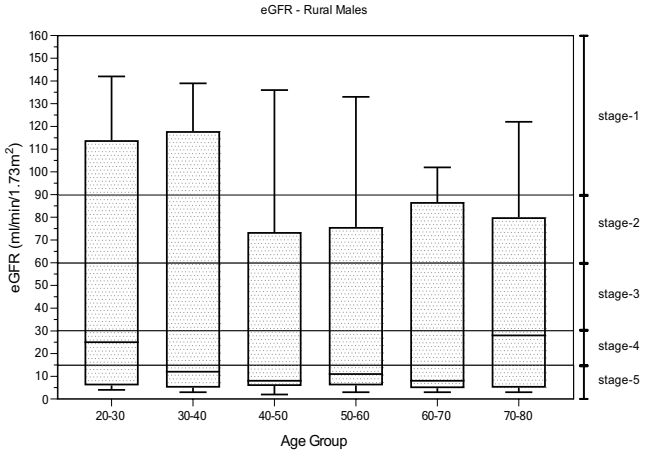

Figure 3: eGFR of rural males

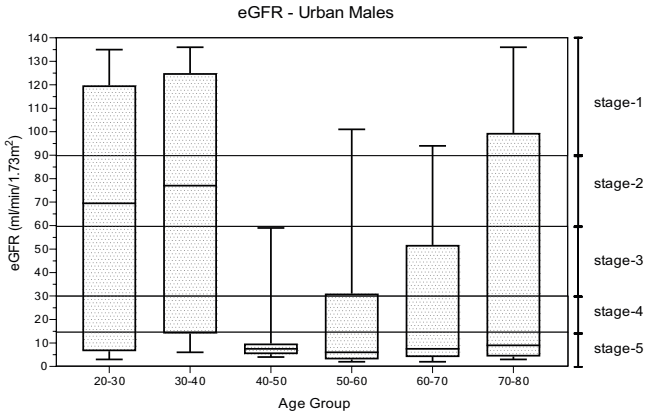

Figure 4: eGFR of urban males

DISCUSSION

Previous studies showed the significant relationship of hypertension and diabetes with CKD irrespective of age . National survey depicts the high prevalence in some specific diseases such as 1 in 5 and 1 in 3 individuals suffering from diabetes and hypertension respectively . It is estimated that 1.2 billion peoples live in below poverty line in developing countries . Deprivation from basic health facilities regarding CKD diagnosis, its management including dialysis and kidney transplant increases the rate of morbidity and mortality. CKD requires immediate efforts and attracts the attention of public health organizations in Pakistan. In our study, it was found that males had greater incidences of having CKD as compared to females i.e., 58.3% and 41.6% respectively. Gender has an important influence on certain aspects of CKD. Men are at higher risk of incidence of renal failure than women. Many studies show same findings as stated formerly. Among female strata, most prevalent age groups were 30-40 and 40-50 having incidence rate of 27.6% and 23.9% respectively. Second most prevalent age groups were 50-60 and 20-30 that had prevalence 18.8% and 14.9% respectively. Least prevalent age groups were 60-70 and 70-80 that had 10.2% and 4.6% prevalence, respectively (Table 1). In the literature similar reports have already been given by various researchers ". Age and gender were basic variables that were examined in this study. Among male strata, CKD was most prevalent in age groups ranging 40-50 and 50-60 i.e., 24% and 24.3% respectively. Second most prevalent age groups were 20-30 and 60-70 i.e., 15.6%. Whereas age group 30-40 had 10.9% prevalence and age group 70-80 had 9.4% CKD prevalence (Table 2). In the literature similar findings has been reported Age is a considerable factor that influences creatinine levels. As age increases, a prominent decline in GFR is observed in the general population. A study in United states has presented same findings regarding effect of age on creatinine levels . CKD causes many complications which can be lethal in some cases. Management of CKD is a very important part to improve the quality of life of a patient. Cardiovascular complications are seen to be most common and can intervene with lethal effects of CKD. Management and early diagnosis is very important to prevent concomitant diseases.

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