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A STUDY ON EPIDEMIOLOGY OF CHRONIC KIDNEY DISEASE IN A PAKISTANI POPULATION

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Abstract:

Introduction: *Chronic Kidney Disease (CKD) is progressive loss of renal function. CKD is a great burden on Pakistan's healthcare resources. Lack of screening and risk identification often result in delayed treatment and implementation of preventive measures.* ***Aim and objectives:*** *The basic aim of the study is to analyze epidemiology of chronic kidney disease in a Pakistani population.* ***Methodology of the study:*** *This study was conducted during March 2018 in the DHQ Hospital, Palandri, Azad & Jammu Kashmir. This study was basically conducted for the analysis of role of RAAS in the management of CKD. A diagnosis of chronic tubulo-interstitial disease was made based on history of polyuria, nocturia with low-specific gravity of urine and low or normal blood pressure associated with small kidneys on ultrasound.* ***Results:*** *A total of 50 patients were initially included in the study, with a male to female ratio of 1:1. A total of 50 patients were considered for final analysis based on data adequacy. The mean age of the population was 46.3 years, with the minimum age being 20 years and the maximum being 83 years. Common causes of CKD identified in these patients included diabetic nephropathy, glomerulonephritis, hypertension, tubulo-interstitial disease and renal stone disease.* ***Conclusion:*** *It is concluded that considering the alarmingly high prevalence of CKD compared to other countries and its impact on morbidity, mortality and financial burden, we recommend that early detection and treatment of the disease should be the priority in healthcare policies of the region.*

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INTRODUCTION:

Chronic Kidney Disease (CKD) is progressive loss of renal function. CKD is a great burden on Pakistan's healthcare resources. Lack of screening and risk identification often result in delayed treatment and implementation of preventive measures. Chronic kidney disease (CKD) is a major public health problem, and preventing CKD and/or delaying progression of CKD patients to end-stage renal disease (ESRD) is a major task for the nephrology community [1]. This looks like an achievable target, in particular because of the availability of reno-protective drugs that may interfere with disease progression such as the inhibitors of the renin-angiotensin-aldosterone system (RAAS). After the first inhibitor of angiotensin II (AII) system, the angiotensin-converting enzyme (ACE) inhibitor captopril, became available for clinical use in the early 1980s [2], other drugs have become progressively available that interfere with RAAS activity, such as AII-type 1 receptor blockers (ARBs) and the aldosterone(Aldos) antagonists that inhibit AII and Aldos activity by competitively antagonizing their binding to specific receptors [3]. In a short future, novel agents that interfere with renin activity (such as aliskiren) will also become available for clinical use [4], which will further increase the armamentarium of drugs that may interfere with the sequence of events, eventually resulting in AII and Aldos production at different levels and that, used in combination, may achieve an almost complete inhibition of the RAAS. In addition, to identify the optimal regimens to maximize reno-protection, major efforts should be made in identifying and treating all patients at risk, with the final aim to delay or even prevent the onset and progression of chronic renal disease and related complications [5].

Aim and objectives

The basic aim of the study is to analyze epidemiology of chronic kidney disease in a Pakistani population.

METHODOLOGY OF THE STUDY:

This study was conducted during March 2018 in the DHQ Hospital, Palandri, Azad & Jammu Kashmir. This study was basically conducted for the analysis of role of RAAS in the management of CKD. A diagnosis of chronic tubulo-interstitial disease was made based on history of polyuria, nocturia with low-specific gravity of urine and low or normal blood pressure associated with small kidneys on ultrasound.

The other etiologies of CKD were determined based on renal biopsy and ultrasound findings. The stage of CKD was established by recording the most recent (within the last three months) eGFR according to the (Modification of Diet in Renal Disease (MDRD) equation. Reports from Pakistan have shown that eGFR measured by the Cockcroft Gault or MDRD formula is a better predictor of reduced GFR than serum creatinine alone in the Pakistani population.

Data collection

For this study the data was collected from 50 patients who were suffering from kidney disease. For this purpose we make two groups of study. One group was control group and the other group was suffering from kidney problems. Then we collect the socio economic status and therapy status of both groups. Then we analyze the data and find that either statin therapy is helpful for patients or not.

Analysis

Student’s t-test was performed to evaluate the differences in roughness between groups. Two-way ANOVA was performed to study the contributions. A chi-square test was used to examine the difference in the distribution of the fracture modes (SPSS 19.0 for Windows, SPSS Inc., USA).

RESULTS:

Table 01 of the data shows the basic values of control group and patients. It shows the BMI, age, Total cholesterol level and other basic values. We can find that cholesterol level is high in patients as compared to normal values. We also shows the comparison of statin group and normal group.

Table 01: General values of Control group and diseased group

Variable	Diseases Group	Control Group	t Value	*p* Value
Age（Year）	56.56±8.46	53.64±8.36	1.716	0.081
BMI（kg/m2）	24.31±2.26	23.37±2.09	2.195	0.031
SBP（mmHg）	140.36±15.70	116.53±13.46	8.248	0.000
DBP（mmHg）	87.94±10.69	75.81±9.94	5.967	0.000
PP（mmHg）	52.42±12.87	40.72±8.74	5.426	0.000
FBG（mmol/）	5.12±0.65	5.06±0.49	1.764	0.081
TG（mmol/L）	1.74±0.75	1.69±0.86	1.838	0.071
TC（mmol/L）	4.95±0.76	4.88±0.82	1.712	0.090
HDL-	1.30±0.43	1.31±0.56	1.717	0.089
LDL-C	3.46±0.58	3.38±0.66	1.139	0.266

Tale 02 shows the values of analysis of CKD in selected patients. A total of 50 patients were initially included in the study, with a male to female ratio of 1:1. A total of 50 patients were considered for final analysis based on data adequacy. The mean age of the population was 46.3 years, with the minimum age being 20 years and the maximum being 83 years. Common causes of CKD identified in these patients included diabetic nephropathy, glomerulonephritis, hypertension, tubulo-interstitial disease and renal stone disease. The cause was unknown in a significant percentage of patients. Other causes including post-partum renal failure, which constituted 2% of the cases

Table 02: Etiology of chronic kidney disease in the study patients.

Category	Number of subjects	Percentage
Diabetic nephropathy	140	28%
Glomerulonephritis	110	22%
Hypertension	73	14.6%
Tubulo-interstitial nephritis	67	13.4%
Unknown cause	53	10.6%
Renal stone disease	40	8%
Adult polycystic kidney disease	7	1.4%
Other causes	10	2%
Total	500	100%

DISCUSSION:

CKD is a worldwide public health issue, the incidence and prevalence of which are increasing, resulting in high cost and poor outcomes [6]. In the United States, the prevalence of earlier stages of CKD is approximately 100times greater than the prevalence of kidney failure, affecting almost 11% of adults in the United States. The situation is probably the reverse in developing countries, where late presentation is more common [7]. CKD is defined as abnormalities of kidney structure or function, present for at least three months, and representative estimates of the burden of CKD in most developing countries are lacking. No data regarding the epidemiological pattern have been reported from our catchment area, and this justifies our study. It is estimated that the annual incidence of new cases of end-stage renal disease (ESRD) is >100 per million population in Pakistan. In our study, diabetes was the leading cause of CKD, confirming previous results from Pakistan [8]. These results are also consistent with those reported from Western countries. According to the United States Renal Data System (USRDS), diabetes is the leading cause of ESRD (42.9%). The prevalence of diabetes in countries of the Indian subcontinent is higher than that reported in Western countries, and is expected to multiply over the next two decades [9]. Glomerulonephritis remains the second leading cause of CKD, which probably reflects the high prevalence of infections in our society. Studies from Karachi have reported chronic glomerulonephritis as the leading cause of ESRD in dialysis patients, indicating the high prevalence of infections in the community [10].

There are several pathogenetic factors in which Aldo, via the non-genomic pathway, may contribute to CKD. Experimental models of CKD have demonstrated a key role for Aldo-mediated glomerular and tubular injury and inflammation. This injury is mediated in part by activation of oxidative stress molecules, up-regulated in part by NADPH oxidase, including pro inflammatory cytokines such as IL-6, MCP-1, ICAM-1, osteopontin and TGF-beta [11]. Both tubulointerstitial damage and glomerular injury, particularly of the podocytes, occurs secondary to this non-genomic effect of Aldo. Blockade of the MCR using drugs like spironolactone and eplerenone attenuate or abrogate all these effects. An interesting finding is that some of the beneficial effects of Aldo blockade are believed to be, in part, by improvement in endothelial dysfunction [12].

CONCLUSION:

It is concluded that considering the alarmingly high prevalence of CKD compared to other countries and its impact on morbidity, mortality and financial burden, we recommend that early detection and treatment of the disease should be the priority in healthcare policies of the region.

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