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ANALYSIS OF ROLE OF CARDIOVASCULAR DAMAGE IN CHRONIC KIDNEY DISEASE

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Abstract:

Introduction: *Chronic kidney disease (CKD) is a global health burden estimated to affect up to 15% of adult populations and is independently associated with increased cardiovascular (CV) disease risk similar to the risk of diabetes mellitus or coronary heart disease.* ***Aims and objectives:*** *The basic aim of the study is to analyze the role of cardiovascular damage in chronic kidney disease in local population of Pakistan.* ***Material and methods:*** *This study was conducted at hospitals of Multan and Sheikhupura during Oct 2017 to Dec 2017. The study was conducted according to the rules and regulations of ethical committee. For this purpose we conduct the data from both genders and we select those patient who was suffering from both kidney diseases and some kind of heart issue. The selected patients were studied for further analysis.* ***Results:*** *The demographic values shows that there is a direct relationship of background of the patient and CKD and CVD. The suboptimal performance of current non-invasive tests makes coronary angiography the desirable investigation in high-risk patients. High-risk patients are clinically defined by clinical evidence of actual or past vascular arterial disease, heart failure and previous stroke or myocardial infarction.* ***Conclusion:*** *It is concluded that most of the patient of CKD were also suffering from CVD and they are died due to CVD. Serum biomarkers routinely used in non-CKD population are less useful as they are elevated without evidence of myocardial necrosis.*

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INTRODUCTION:

Chronic kidney disease (CKD) is a global health burden estimated to affect up to 15% of adult populations and is independently associated with increased cardiovascular (CV) disease risk similar to the risk of diabetes mellitus or coronary heart disease [1]. This risk increases as CKD advances and is evidenced by worsening excretory function, usually manifest as declining glomerular filtration rate, and increasing proteinuria [2]. The overall cost of CKD accounts for 1.3% of healthcare budgets of which 13% is related to the excess myocardial infarctions and strokes associated with CKD [3].

Assessment of CV risk using prognostic models in the general population, particularly for primary prevention, is embedded in clinical practice. Such prognostic models use data from routinely collected risk factors and can be automated using electronic medical records into routine clinical care. CV prognostic models developed specifically for CKD have significant methodological weaknesses, including no external validation and limited model metrics' assessment, and thus may miscalculate risk in CKD. This contributes to their lack of clinical utility [4].

There have been several important developments in the literature recently regarding the association between acute kidney injury (AKI) and chronic kidney disease (CKD) [5]. First, when the National Kidney Foundation promulgated their highly influential Kidney Disease Outcomes Quality Initiative (KDOQI) CKD guidelines in 2002, six chapters were devoted to the complications associated with decreased glomerular filtration rate (GFR) including hypertension, anemia, nutritional status, bone disease/disorders of calcium and phosphorus metabolism, neuropathy, and indices of functioning [6]. Much of the CKD epidemiology literature around the time of and following the KDOQI CKD guideline publication focused on how reduced (estimated) GFR (and proteinuria) is related to risk of end-stage renal disease, cardiovascular events, and death. Since 2008, however, a number of papers have sought to better quantify how the severity of CKD is a risk factor for development of AKI [7].

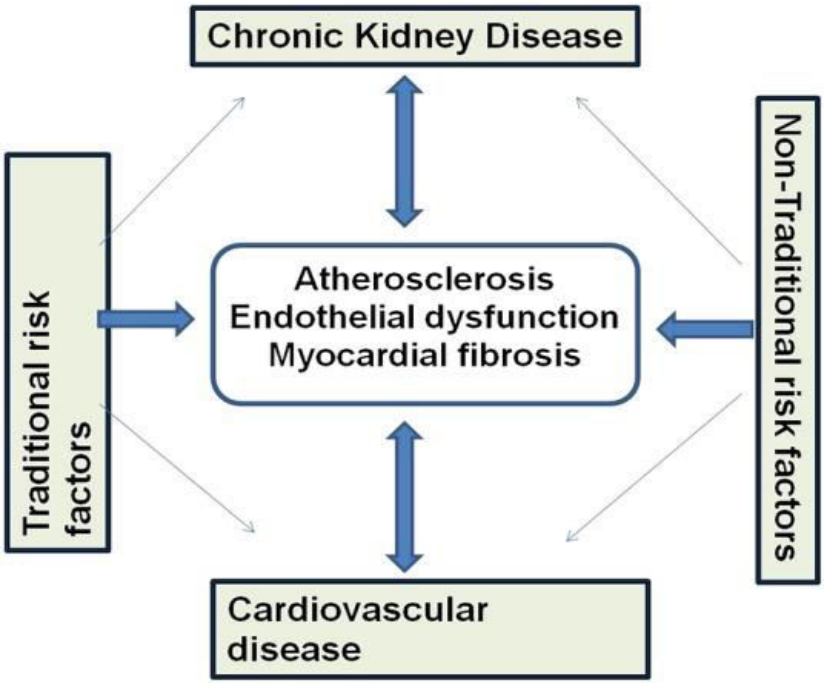

Figure 01: Interrelationship of chronic kidney disease and CVD

Aims and objectives

The basic aim of the study is to analyze the role of cardiovascular damage in chronic kidney disease in local population of Pakistan.

MATERIAL AND METHODS:

This study was conducted at hospitals of Multan and Sheikhupura during Oct 2017 to Dec 2017. The study was conducted according to the rules and regulations of ethical committee. For this purpose we conduct the data from both genders and we select those patient who was suffering from both kidney diseases and some kind of heart issue. The selected patients were selected for further analysis. We conduct the socio-demographic data of patients to find the reason of kidney problem and heart issues.

Diagnosis of CKD in CVD

The classic triad of ischaemic symptoms, elevated cardiac biomarkers and ECG changes is frequently absent in patients with CKD, making diagnosis of CAD challenging. Moreover, there is paucity of data on the utility of various diagnostic modalities in patients with CKD. This is due to the exclusion of patients with renal dysfunction from major randomized trials and in part due to reduced negative predictive value of these tests secondary to the increased prevalence of CAD in this population[8].

Analysis of data

The collected data were analyzed using SPSS software (version 17). The results are presented as a mean with 95% confidence interval limits or standard deviations. The significant value for P <.05 was accepted as statistically significant.

RESULTS:

The demographic values shows that there is a direct relationship of background of the patient and CKD and CVD. Mostly smokers are suffered from kidney and heart problems and their BP become also high. (Table 01).

Table 01: Demographic characteristics of the selected group

Variables	Co-efficient	SE
Blood pressure	0.048	0.35
Healthy eating index (HEI)	−0.059	0.05
Smoker	0.060	0.80
Food security	0.106	0.12
Drinker	-0.343	0.08
Belong to city area	0.057	0.01
Belong to rural area	0.59	0.70
BMI	0.5460.24	

It is recommends that non-invasive stress testing may be considered in kidney transplantation candidates with no active cardiac conditions on the basis of the presence of multiple CAD risk factors regardless of functional status. The suboptimal performance of current non-invasive tests makes coronary angiography the desirable investigation in high-risk patients. High-risk patients are clinically defined by clinical evidence of actual or past vascular arterial disease, heart failure and previous stroke or myocardial infarction.

Table 02: analysis of various diagnostic tools for diagnosis of cardiovascular disease in CKD

Diagnostic modality	Comment
ECG	Should be done yearly; for LVH and baseline rhythm
Resting echocardiography	LV function,, valvular disease; operator dependent
Cardiac SPECT	Variable sensitivity; effect of antihypertensive agents; good negative predictive value
Stress CMR	Good sensitivity and specificity; not in eGFR <30 mL/min/m^2
Coronary CT angiography	Not in established CAD/ESRD; higher burden of coronary calcium confounder
Coronary angiography	Gold standard; invasive, loss of residual renal function

DISCUSSION:

The mainstay of medical management of CVD is therapy with aspirin, statins, ACE inhibitors (ACEi) or angiotensin receptor blockers (ARBs) and β blockers. Optimal glycaemic control and control of blood pressure are of paramount importance in patients with CKD as in the normal population [9]. Though CVDs are rampant in patients with CKD, there is scarce evidence on the optimal management strategy of this subgroup. This is because almost all the major trials have excluded patients with renal dysfunction. Charytan and Kuntz reviewed 86 trials with over 400 000 patients, of which 80% of the trials excluded ESRD subjects and baseline renal function was reported in only 7% of the trials. Moreover, the benefits obtained from standard medical therapy in non-CKD population cannot be extrapolated to the CKD population. This leads to the dilemma being faced while treating a patient with renal dysfunction [1-3]. Observational studies have also shown that optimal drugs are not used adequately in CKD subjects [10]. 'Therapeutic nihilism' for conventional standard therapies could be due to lack of confidence in use of these measures in CKD or due to fear of doing harm in these patients with these measures and this reluctance to use proven therapies in patients with CKD leads to dismal prognosis of patients with CVD. Though, there is paucity of randomized trials so far in this topic, a summary of current evidence is presented.

Studies of non-traditional risk factors associated with uremia-related arteriosclerosis and cardiomyopathy were also identified by the systematic review[11]. Of these risk factors, albumin, haemoglobin and phosphate were included in at least four studies and had a statistically significant pooled hazard ratio for CV events. Other non-traditional risk factors that could be candidate risk factors for inclusion in a CV prognostic model include those associated with cardiomyopathy, such as left ventricular hypertrophy, urate, and those associated with both cardiomyopathy and arteriosclerosis including calcium, parathyroid hormone and urea nitrogen. Some of these risk factors have been considered in prognostic models identified [12].

CONCLUSION:

It is concluded that most of the patient of CKD were also suffering from CVD and they are died due to CVD. Serum biomarkers routinely used in non-CKD population are less useful as they are elevated without evidence of myocardial necrosis. This increase is not secondary to reduced renal clearance as thought earlier but due to silent micro infarction and myocardial apoptosis

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