Volume : 4 | Issue : 9 | Sept 2015 • ISSN No 2277 - 8179

Research Paper

Prevalence of Chronic Kidney Disease and the Incidence of Acute Kidney Injury in Patients with Coronary Artery Disease in Vidarbh region of Maharashtra

Medical Science

KEYWORDS : hemodialysis, CAD

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ABSTRACT

Background: To determine the prevalence of chronic kidney disease (CKD) and incidence of acute kidney injury (AKI) in patients with coronary artery disease (CAD) demonstrated on coronary angiography.

Materials and Methods: Totally, 125 patients admitted to a tertiary hospital in Vidarbh region of Maharashtra with CAD were included in the study.

Results: 49 out of 125 (39.2%) were found to have underlying CKD. 69% (34) of these CKD patients developed AKI. 21 out of 34 patients who developed AKI required hemodialysis.

Conclusion: Our study concludes that there is a very high prevalence of CKD (39.2%) in patients with CAD and AKI is a very important complication (38.4%) in these patients.

INTRODUCTION

Chronic kidney disease (CKD) is a worldwide public health problem.[1] CKD occurs commonly in patients with cardiovascular disease (CVD). CKD is a major and serious risk factor for coronary artery disease (CAD).[2] CAD is extremely common in the population of uremic patients. In people with established CAD, CKD predicts recurrent events as strongly as other established cardiovascular risk factors such as diabetes and elevated blood pressure.[3] Whether the cardiovascular risk in the setting of CKD is due to increased atherosclerotic burden, higher risk of plaque rupture as a result of inflammation,[4] or other mechanisms is unknown.

The incidence and severity of obstructive CAD increases as glomerular filtration rate (GFR) declines.[5,6] CAD shows a pattern of diffuse multivessel involvement with coronary calcification; small angiographic studies suggest that this incidence exceeds 50% in unselected CKD five-dimension patients.[7,8,9,10,11]

Our study aims to determine prevalence of CKD in patients with CAD demonstrated on CAG and to determine how many went on to develop AKI.

MATERIALS AND METHODS

Totally, 125 patients admitted to a tertiary hospital in Vidarbh region during 1 year between 1-8-2013 and 30-7 2014 with acute coronary syndrome with angiographic evidence of >50% stenosis in one or more coronary vessels were included in the study

All patients were evaluated for the evidence of CKD. Serum creatinine, routine urine analysis, and spot urine for protein to creatinine ratio of all patients were measured using the standard technique in the clinical laboratory.

AKI was defined according to the risk, injury, failure, loss, and end-stage kidney (RIFLE) criteria.[19]

RESULTS

Totally, 125 patients with angiography proven CAD were included in the study. Majority of patients (40%) belong to 60–70 years age group [Table 1]. Among 125 patients, 77.6% were found to be males and 22.4% were found to be females [Table 1]. Hypertension was found to be the more prevalent (66.4%) co-morbid condition associated with CAD, followed by diabetes mellitus (50.4%).

Table 1
Demographic variables of patients studied

Demographic variables	Number of patients	Percentage
Age in years		
<30	0	0.0
30-40	2	1.6
40-50	14	11.2
50-60	39	31.2
60-70	50	40.0
>70	20	16.0
Gender		
Male	97	77.6
Female	28	22.4
Total	125	100.0

AKI developed in 38.4% of patients. 69% of these had underlying CKD

Table 2
AKI

AKI	Number of patients (*n*=125)	Percentage
Absent	77	61.6
Present	48	38.4
AKI in non-CKD	14	
AKI in CKD	34	

AKI: Acute kidney injury, CKD: Chronic kidney disease

Contrast-induced nephropathy (CIN) preventive measures in the form of hydration using normal saline or N-acetyl cysteine or sodium bicarbonate were used in 46.9% of CKD patients [Table 3].

Table 3
CIN preventive measures and its influence on the development of AKI

CKD (*n*=49)	Number of patients
CKD with CIN prevention	23
AKI	12
No AKI	11
CKD without CIN prevention	26
AKI	22
No AKI	4

CIN: Contrast-induced nephropathy, CKD: Chronic kidney disease, AKI: Acute kidney injury

In our study, 78% of the subjects studied were males, 22% of the

subjects were females, indicating that CAD is more prevalent among males than females. These findings were similar with the results of the studies by Liu *et al.*[22]

Prevalence of chronic kidney disease in coronary artery disease

We found that the prevalence of CKD among 125 subjects with CAD was 39.2%. Liu *et al.* in their study found that the prevalence of CKD among the 3513 China Heart Survey (CHS) participants with coronary heart disease was 24.8%.[22].

Incidence of acute kidney injury

In our study, 48 patients (38.4%) out of 125 developed AKI (defined as an increase in serum creatinine levels ≥1.5 × baseline). Of 48 patients who developed AKI, 34 of them had underlying CKD. 54.2% (26 out of 48) of these AKI patients required renal replacement therapy in the form of HD. Requirement of HD was more in patients with underlying CKD (21 vs. 5) as compared to non-CKD patients. Parikh *et al.* performed an observational study of 147,007 elderly Medicare patients admitted for acute myocardial infarction (AMI) as a part of the cooperative cardiovascular project.[24]

Our study concludes

In view of high prevalence of CKD (39.2%) in patients with CAD, every patient undergoing CAG must have renal function evaluation before CAG including Urine*, Spot urine for albumin to creatinine ratio and serum creatinine levels

Considering such a high prevalence of CKD, nephrology referral must be considered in patients with abnormal urinalysis, spot urinary albumin to creatinine ratio, and in patients whose creatinine clearance is <60 ml/min

AKI is an important complication of CAG and precautions should be taken to prevent it

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