

## Study of acute coronary syndrome in chronic kidney disease patients in Sohag University Hospital

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### Abstract

**Background:**Patients with chronic kidney disease have an increased risk of cardiovascular disease compared to the general population. Ischemic heart disease is the most common cause of death in patients with chronic renal disease.

**Aim of the work:**Study of patterns and immediate outcome of acute coronary syndrome in patients with different stages of CKD admitted to sohag university.

**Patients and methods:** this is an observational prospective immediate outcome study including CKD and non-CKD patients with ACS admitted to CCU sohag university hospital within period from 1-11-2016 to 30-4-2017, and Follow up of major cardiac events for 1 month.A detailed history was taken from each patient and full examination was performed . laboratory investigations, ECG , echocardiography and diagnostic coronary angiography were done.

**Results:** CKD patients presented to our CCU with ACS have more risk of complications than non-CKD patients. The most presented complication in CKD patients with ACS is heart failure

**Conclusion:** we conclude that risk factors for ACS in CKD patients more than non-CKD patients. CKD patients with ACS more susceptible to complications rather than non-CKD patients.

### Introduction

Chronic kidney disease (CKD) or chronic renal failure (CRF), as it was historically termed is a term that encompasses all degrees of decreased renal function, from damaged-at risk through mild, moderate, and severe chronic kidney failure. CKD is a worldwide public health problem. In the United States, there is a rising incidence and prevalence of kidney failure, with poor outcomes and high cost (*O'Hare AM, Choi AI et al.2007*)

Patients with chronic kidney disease have an increased risk of cardiovascular disease compared to the general population. Ischemic heart disease is the most common cause of death in patients with chronic renal disease, and patients with acute coronary syndromes (ACS)

usually suffer from chronic renal disease (*Palmer SC, et al. 2012*)(*Baber U, Auguste U. 2013* ).Furthermore chronic renal disease is associated with poor survival in patients with acute coronary syndrome with greater mortality and reinfraction rates (*Medi C . 2009*)(*Saltzman AJ, et al.2011*).

#### Aim of the study

Study of patterns and immediate outcome of acute coronary syndrome in patients with different stages of CKD admitted to sohag university hospital CCU , with or without risk factors (diabetes mellitus , hypertension, hyperlipidemia ).

#### Patients and methods

this is an observational prospective immediate outcome study including CKD and non-CKD patients with ACS

admitted to CCU sohag university hospital within period from 1-11-2016 to 30-4-2017, and Follow up of major cardiac events for 1 month.A detailed history was taken from each patient and full examination was performed .

laboratory investigations including ( serum creatinine , CBC, cardiac biomarkers ) ECG , echocardiography and diagnostic coronary angiography were done.

## Results

Our study is observational prospective study including two groups of patients developing ACS who are admitted to CCU in Sohag University Hospital , these two groups are:

- 1-group of patients in different stages of CKD.(group A)
- 2- group of non-CKD patients.(group B)

**Comparison between group A and group B as regard presentation at CCU:**

Presentation at CCU	Group A N=50	Group B N=50	P value
<b>Unstable angina</b>			
Yes	28 (46.7%)	40 (80.00%)	0.0003
No	32 (53.3%)	10(20%)	
<b>STEMI</b>			
Yes	13 (26.00%)	10 (20.00%)	0.48
No	37(74%)	40(80%)	
<b>NSTEMI</b>			
Yes	9 (18.00%)	0(0.0)	0.002
No	41(82%)	50(100%)	

### Presentation at CCU

The most presented pattern of ACS in our CCU is unstable angina (28) patients with percentage of (56%) of total number of CKD group and( 40) patients with percentage of( 80%) of total number of non-CKD group

The second frequent presentation is STEMI in both groups 26% in CKD group and 20% in non-CKD group

There is high incidence of unstable angina in non-CKD patients **P value =0.0003**

There is high incidence of NSTEMI in CKD patients **P value =0**

**Comparison between group A and group B as regard in hospital complications:**

Complications at CCU	Group A N=50	Group B N=50	P value
Complications Yes	30 (60.00%)	14 (28.00%)	<b>0.000</b>
No	20 (40.00%)	36 (72.00%)	
<b>Type of complication if present</b>			
Shock Yes	2 (4%)	0(0.0)	0.15
No	48 (96%)	50(100)	
Heart failure Yes	19 (38%)	6 (12%)	<b>0.003</b>
No	31(62)	44(88%)	
Arrhythmia			
Yes	7 (14%)	8 (16%)	0.78
No	43(86%)	42(84%)	
Deaths Yes	2 (4%)	0(0)	0.15
No	48(96%)	50(100%)	

**Comparison between group A and group B as regard complications**

CKD patients presented to our CCU with ACS have more risk of complications than non-CKD patients (60% of CKD patients and 28% of non-CKD patients ) **P value 0.005**

During follow up period of our study there are two deaths of CKD group (4%) while no deaths in non-CKD group.

**Comparison between group A and group B as regard type of complications**

The most presented complication in CKD patients with ACS is heart failure , while the most presented complication in non-CKD patients with ACS is arrhythmia.

There is significant relationship between heart failure and CKD in patients presented to our ccu with ACS **P value =0.003**

**Discussion**

We aimed to study the patterns of ACS in different stages of CKD patients admitted to CCU at Sohag University Hospital comparing this with patterns of ACS in patients with normal kidney functions . It is an observational prospective study of CKD patients presented with ACS. Follow up of those patients for major cardiac events and immediate outcomes during period of study . Regarding traditional risk factors for ACS in both CKD and non-CKD patients, in our study we recorded (52%) of CKD patients had DM but (32%) of non-CKD patients had DM and so DM carrying higher risk for

developing ACS in CKD patients than non-CKD patients with significant p value 0.04 and this was similar to **Levey AS, Coresh J et al.2003** and **. Reiner Z, Catapano AL et al.2011** study who said that patients with CKD or DM are considered to be at a very high risk of developing coronary heart disease (CHD), or even a CHD equivalent. Regarding anemia in our study as a nontraditional cardiovascular risk factor in group A patients , Hb range from (5-14) with mean (10.28±1.93) and median (10.1) while in group B patients Hb range from (11.8-15) with mean (13.38±0.98) and median (13.4) with a

significant p value < 0.0001 . Also **Levin A, Thompson CR et al.1999** study informs that For every 1 g/dL decrease in haemoglobin, there was a 6% increase in LVH. In particular, LVH is known as a traditional risk factor for CVD . the prevalence of LVH increased progressively with declining levels of creatinine clearance (CrCl) (26.7%, 30.8%, and 45.2%) for CrCl >50 mL/min, 25–49 mL/min, and <25 mL/min, respectively. As regarding patterns of ACS in CKD and non-CKD group in our study, (56%) of CKD patients presented with unstable angina while (80%) of non-CKD patients presented with unstable angina with significant p value 0.0003 , (26%) of CKD patients presented with STEMI while (20%) of non-CKD patients presented with STEMI with insignificant p value 0.48 lastly (18%) of CKD patients presented with NSTEMI while no presentation of NSTEMI in non-CKD patients in our study with significant p value 0.002 comparing that to **International Journal of Nephrology and Renovascular Disease 2016** study whereas 168 patients (50.3%) had STEMI while 166 patients (49.7%) had NSTEMI . In our study the most common cardiovascular complication in CKD patients is CHF , (38% ) of CKD patients(group A) complicated with CHF , while (12%) of non-CKD patients (group B) complicated with CHF with significant p value 0.003 and this matched with **Bethesda ,MD.2004** study which informs that CHF is the leading cardiovascular condition in CKD patients . In the current study , number of CKD patients with ACS underwent coronary angiography is 7 patients of total 50 patients (14%) while number of non-CKD patients with ACS underwent coronary angiography is 14 patients of

total 50 patients (28%) with p value 0.09 and that in agreement with **Chertow GM, Normand SL et al.2004** study that CKD patients undergo coronary angiography less frequently as compared with non-CKD patients despite the fact that coronary angiography appears to be associated with lower mortality in CKD patients **Chertow GM , Normand SL et al.2004** highlighted the underutilization of coronary angiography by demonstrating that only 25.2% of CKD patients underwent angiography as compared with 46.8% of non-CKD patients . Early invasive strategy is superior to conservative strategy in ACS but underutilized in CKD patients partly due to concerns about nephrotoxicity of radiocontrast agents.

### Conclusion

We conclude that traditional and nontraditional risk factors for ACS in CKD patients more than non-CKD patients. Follow up of patients under study (CKD and non-CKD groups) for major cardiac events and complications. We found CKD patients with ACS more susceptible to complications rather than non-CKD patients .The most common complication in CKD patients with ACS is CHF followed by arrhythmia then cardiogenic shock.

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