



RENAL DYSFUNCTION; IN PATIENTS WITH ACUTE CORONARY SYNDROME (ACS) AT A TERTIARY CARE HOSPITAL.

Ayesha Ijaz¹, Asna Ijaz², Abubakr Ali Saad³, Salman Zafar⁴, Sohail Safdar⁵, Shoaib Rafique⁶

1. MBBS
House Officer,
Nishtar Medical University, Multan.
2. MBBS
WMO,
Fatima Jinnah Women Hospital,
Multan.
3. MBBS, FCPS
Senior Registrar Cardiology,
Nishtar Medical University, Multan.
4. MBBS,
Medical Officer,
Nishtar Medical University, Multan.
5. M. Sc, M. Phil
Senior Research Officer,
PHRC Research Centre,
Nishtar Medical University, Multan.
6. MBBS, M. Sc Surgery - I (UK)
Medical Officer,
Govt. Zeenat Medical Centre,
Multan.

Correspondence Address:

Mr. Sohail Safdar,
M. Sc, M. Phil
Senior Research Officer,
PHRC Research Centre,
Nishtar Medical University, Multan.
sohailpmrc@gmail.com,

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ABSTRACT... Objectives: To determine the frequency of renal dysfunction in patients with acute coronary syndrome at a tertiary care hospital. **Study design:** Descriptive Cross-sectional study. **Setting:** Department of Cardiology, Nishtar Hospital Multan. **Duration of study:** Six months from November 2016 to May 2017. **Subjects and Methods:** Consecutive 285 patients who met inclusion criteria of our study were enrolled from department of Cardiology, Nishtar Hospital Multan. History was taken and relevant investigations were done. Computer based formula for MDRD eGFR was used to calculate eGFR in our patients. All these findings were entered in pre-designed, pre – tested study questionnaire. Data was entered and analyzed using computer based software SPSS version 20. All the quantitative variables of the study (such as age, serum creatinine level, GFR value) were calculated for mean and standard deviation. Frequencies and percentages were calculated for categorical variables like gender, residential area, socioeconomic status, level of education, H/O diabetes, H/O hypertension, H/O smoking and family history of IHD etc. **Results:** We studied 285 patients of acute coronary syndrome admitted in Cardiology department of Nishtar Hospital Multan, 210 (73.7%) were male and 75 (26.3%) female. One hundred eighty (63.2%) were from rural area and 105 (36.8%) were urban. One hundred thirty two (46.3%) were from low income group, 144 (50.5%) from middle income and 9 (3.2%) were from high income group. Two hundred four (71.6%) patients presented with chest pain and 72 (25.3%) presented with chest pain and shortness of breath. One hundred eight (37.9%) were hypertensive, 63 (32.6%) were diabetic, 135 (47.4%) were smokers and family history of IHD was present in 102 (35.8%) of the cases. eGFR was calculated by MDRD eGFR formula. eGFR was less than 30 ml/min/1.73 m² in 30 (10.5%) of the cases, 31-60 ml/min/1.73 m² in 66 (23.2%) cases and eGFR was more than 60 ml/min/1.73 m² in 189 (66.3%) of the cases. **Conclusion:** The present study reveals that the substantial proportion of our study patients have underlying renal dysfunction. So eGFR estimation in ACS patients should be given due consideration. This will help in the management of these patients and may improve short and long term disease outcome. Further follow up studies especially in terms of morbidity and mortality in this sub-group of patients are suggested.

Key words: Acute coronary syndrome, renal dysfunction, myocardial infarction.

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INTRODUCTION

Among the cardiac emergencies, ACS still remains the major catastrophic cardiac emergency and leading cause of morbidity and mortality in developing countries.¹⁻³ In hospital mortality has been reported to be 13.5% among the admitted ST segment elevation MI (STEMI) patients.⁴ The patients of ACS are at high risk of short and long term adverse outcomes. The ACS is highest cause of death in UK. The poor prognostic factors include advancing age, presence and severity of ECG changes, high level of bio markers of

myocardial infarction especially serum Troponin levels, presence of left ventricular dysfunction, cardiogenic shock, heart failure, heart rate and arrhythmias, renal impairment, diabetes mellitus, hypertension and anemia.⁵⁻⁸

Renal dysfunction is an independent and important risk factor for cardiac diseases and is also a strong predictor of adverse outcomes in patients with various cardiovascular conditions including ACS, even if it is mild.⁹⁻¹⁵ The adverse outcome in MI patients associated with renal

dysfunction has been reported by Anavekar et al.¹³

Glomerular Filtration Rate (GFR) estimation is an important and independent predictor of in hospital and outpatient mortality in patients with ACS.¹⁶ In Valsartan acute MI trial (VALIANT), 14527 patients of MI were studied and it has been highlighted in this study that even mild renal dysfunction, assessed on the basis of estimated GFR, is to be considered as major risk factor for cardiovascular complications in patients of MI.¹³ It was further noted that 10 units reduction of GFR was associated with 10% increased risk of adverse outcomes in these patients. Amount of renal dysfunction as assessed by serum creatinine may be misleading because insignificant slight increase in serum creatinine, or even patients with normal creatinine may have significant renal dysfunction as estimated by Modification of Diet in Renal Diseases (MDRD eGFR) formula. It was also found that up to 30 % of these patients undergoing primary percutaneous coronary intervention are expected to have significant renal dysfunction as defined by MDRD eGFR less than 60 ml/min/1.73 m².¹⁷

Hence renal dysfunction remains important issue in patients with ACS. The present study has been conducted to see the frequency of renal dysfunction on the basis of MDRD eGFR in ACS patients.

SUBJECTS AND METHODS

Study design

Descriptive cross – sectional study.

Setting

Department of cardiology, Nishtar Hospital Multan.

Duration of study

It was six months from November 2016 to May 2017.

Sample size

285 patients with ACS.

Sampling Technique

Non – probability, purposive sampling.

Inclusion Criteria

1. Both genders.
2. Age range (More than 20 years).
3. Patients with ACS.

Exclusion Criteria

1. Patients having any malignancy will not be included.
2. Renal transplanted patients.
3. Pregnant ladies.
4. Patients who have already undergone cardiac intervention or surgery.
5. Who do not give consent for participation.

Consecutive 285 patients who met inclusion criteria of our study were enrolled from department of Cardiology, Nishtar Hospital Multan. Informed written consent was taken from each patient describing them objectives and benefits of this study, ensuring them confidentiality of the information provided and the fact that there is no risk involved to the patient while taking part in this study.

Relevant history was taken. Clinical examination and relevant investigations were carried out. All socio-demographic information (like age, gender, residential status, socioeconomic status, etc) was also asked. Computer based formula for MDRD eGFR was used to calculate eGFR in our patients. All these findings were entered in pre-designed, pre – tested study questionnaire.

Data was entered and analyzed using computer based software SPSS version 20. All the quantitative variables of the study (such as age, serum creatinine level, GFR value) were calculated for mean and standard deviation. Frequencies and percentages were calculated for categorical variables like gender, residential area, socioeconomic status, level of education, H/O diabetes, H/O hypertension, H/O smoking and family history of IHD etc.

RESULTS

We studied 285 patients of acute coronary

syndrome admitted in Cardiology department of Nishtar Hospital Multan, out of which 210 (73.7%) were male and 75 (26.3%) female. One hundred eighty (63.2%) were from rural area and 105 (36.8%) were urban. One hundred thirty two (46.3%) were from low income group, 144 (50.5%) from middle income and 9 (3.2%) were from high income group. Two hundred four (71.6%) patients presented with chest pain and 72 (25.3%) presented with chest pain and shortness of breath. One hundred eight (37.9%) were hypertensive, 63 (32.6%) were diabetic, 135 (47.4%) were smokers and family history of IHD was present in 102 (35.8%) of the cases. eGFR was calculated by MDRD eGFR formula. eGFR was less than 30 ml/min/1.73 m² in 30 (10.5%) of the cases and eGFR was 31-60 ml/min/1.73 m² in 66 (23.2%) cases and eGFR was more than 60 ml/min/1.73 m² in 189 (66.3%) of the cases.

DISCUSSION

Both ACS and renal dysfunction patients have cardiovascular risk factors in common and various researchers have studied the existence of renal dysfunction in ACS patients. The underlying uremic risk factors for accelerated atherogenesis in renal dysfunction patients, put these patients to further risk for coronary artery disease. Renal insufficiency has been described as an independent risk factor for cardiac diseases. The independent association between renal dysfunction underlying in ACS patients has also been studied.^{18,19} Renal dysfunction is also an important predictor of poor short as well as long term outcomes in ACS patients.¹³ Indeed, renal insufficiency in ACS patients doubles the mortality rates and it is 3rd important cause for prediction of mortality in these patients.²⁰

We studied 285 admitted patients of ACS. Two hundred ten (73.7%) were male and 75 (23.3%) were female, eGFR was calculated. In our study eGFR was less than 30 ml/min/1.73m² in 30 (10.5%) of cases, 31 – 60 ml/min/1.73m² in 66 (23.2%) of cases and it was more than 60 ml/min/1.73m² in rest of cases. Among the ACS patients, 48 (16.8 %) with low eGFR (i.e. 60 ml/min/1.73m²) were diabetic, 42 (14.7%) were hypertensive, 45 (15.8 %) were smokers and 45 (15.8%) were having

positive family history of IHD.

It has also been reported that almost 40 % of the cases with non ST segment elevation myocardial infarction (MI) and 30 % of the cases having ST segment elevation MI have renal insufficiency as defined by eGFR less than 60 ml/min/1.73 m².²¹ The pathophysiology in ACS patients with underlying renal dysfunction has been studied²² Lesions in the coronaries of patients with renal dysfunction were found to be longer with more luminal encroachment and have higher plaque burden compared to coronaries of non renal dysfunction patients. Coronary plaque composition assessed with radio frequency IVUS depicted greater necrotic core with dense calcium and less fibrous tissue, all these changes make the coronary plaque less stable. Furthermore serum matrix metalloproteinases were found raised in cases of moderate to severe renal dysfunction patients and these result in progression of plaque and degradation of overlying fibrous cap.²³ Experimental data support the view that renal dysfunction increases foam cell generation by stimulating macrophage entry into vascular endothelium.²⁴ Further studies have revealed an accelerated infarct expansion, active inflammation and oxidative stress in patients having ACS with renal dysfunction.²⁵ Morenzi et al²⁰ have suggested that eGFR should be done as baseline and should be part of evaluation of any patient admitted with ACS, especially if they have hypertension, diabetes mellitus and low hemoglobin. Similar findings have also been suggested by Hemmelgarn et al.²⁶ Amsterdam et al²⁷ suggested that non-ST segment elevation MI patients must have eGFR estimated initially and throughout the optimal care of these patients, this will decrease complications and hence mortality.

The baseline estimation, while these ACS patients are being optimally treated, may prevent complications like contrast induced nephropathy, coronary stent thrombosis and re-stenosis, bleeding can be minimized while doing reperfusion procedures. ACS patients with underlying renal dysfunction have prolongation of bleeding time, abnormal platelet aggregation and adhesion and also have state of hyper-coagulation.²⁸⁻²⁹ Hence

anti-thrombotic therapy, use of heparin, anti-platelet aggregation agents and drugs like statins may be modified in renal dysfunction patients.

CONCLUSION

The present study reveals that the substantial proportion of our study patients have underlying renal dysfunction. So eGFR estimation in ACS patients should be given due consideration. This will help in the management of these patients and may improve short and long term disease outcome. Further follow up studies especially in terms of morbidity and mortality in this sub-group of patients are suggested.

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Limitation of the study

This was a limited study where we have not followed the patients for their short and long term outcomes in terms of morbidity and mortality.


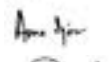
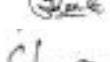
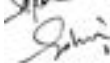

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Ayesha Ijaz	Study planning, designing, coordination in data collection, paper writing and editing.	
2	Asna Ijaz	Study planning, designing, coordination in data collection, paper writing and editing.	
3	Abubakr Ali Saad	Manuscript writing and editing, Final approval.	
4	Salman Zafar	Manuscript writing and editing, Final approval.	
5	Sohail Safdar	Data Entry/analysis, planning and manuscript writing.	
6	Shoaib Rafique	Manuscript writing and editing, Final approval	