**Introduction**

An estimated 7.3 million deaths occurred in 2008 due to coronary artery disease / myocardial infarction (MI) having over 80% in low and middle-income countries without gender discrimination [1,2]. Great progress has been made so far in reducing the mortality but a great menace that still exists is sudden cardiac death [3]. Skeletal muscles, the major pool play an important role can promote moment of potassium into the stores, leading to decreased serum potassium levels within seconds to minutes in acute MI. Different reasons of sudden death are postulated including serum potassium imbalance leading to arrhythmia [4,5].

To define the hypokalemia, the cut off value of serum potassium level is less than 3.5 mEq/L. In a study it was conducted in patients with hypertension, acute MI and heart failure, the frequency of hypokalemia was around 17% [6]. This low serum potassium level has strong correlation with arrhythmias in patients of acute myocardial infarction especially within first 24 hours of presentation. In a retrospective study, the rate of ventricular arrhythmias during first 24 hours of acute MI was 27.3% in patient with hypokalemia while it was 7.5% in patient with normokalemia, a statistically significant difference (P < .001) [7].

Patients with MI are usually followed over 72 hours for any
post thrombolytic event. In a developing country like ours, it is 
mandatory to stratify the patients with greater chances of 
post MI complications so we may prepare our setting for any 
emergency especially in secondary care hospitals with lesser 
facilities. The rationale of this study is that there is no local 
study available in last 10 years and ethnicity is a risk factor 
for hypo or hyperkalemia [8]. Current study will determine 
the frequency of arrhythmia after MI and its relation with 
hypokalemia. This study will not only help physician to decide 
who to declare high risk but also save patient’s life from 
arrhythmias which are usually fatal.

Objective

Objectives of this study were

- To determine the frequency of ventricular arrhythmias in acute myocardial infarction.
- To determine the frequency of ventricular arrhythmias in normokalemic and hypokalemic patients presenting with acute myocardial infarction.

Materials & Methods

A cross sectional survey was done at Department of 
cardiovascular medicine and interventional Cardiology, Jinnah 
Hospital Lahore from 1st February 2018 to 31st July 2018. A total 
of 370 consecutive patients between 40–70 years of age of either 
gender presenting with diagnosis of myocardial infarction in 
24 hours, admitted in emergency department were enrolled in 
the study after obtaining informed consent. Every patient of 
acute MI included in this study was given current standard 
medical therapy. Serum potassium levels were checked in 
these patients before treatment at presentation. Under aseptic 
conditions phlebotomy was done and 5 ml blood was drawn 
for potassium level at the time of presentation. Any ventricular 
arrhythmia was confirmed on ECG within 24 hours after the 
presentation. All patients were classified according to their 
potassium levels. Any ventricular arrhythmia was noted.

Statistical Package for the Social Sciences (SPSS) version 19 
software was used for the analysis of the data. Numerical 
variables like age and serum potassium levels were described as 
means and standard deviations, while categorical variables like 
gender, ventricular arrhythmia and smoking were described as 
frequencies and percentages. Data was stratified for age, 
gender, hypokalemia and normokalaemia versus development of 
ventricular arrhythmias. Chi square test was used to compare 
the frequency of ventricular arrhythmias in hypokalemic and 
normokalemic patients presenting with myocardial infarction, 
post stratification. Significant p value in this study was < 0.05.

Results

In this study we enrolled 370 patients with mean age of 
54.55 ± 9.230. (range 40 to 70 years). 271 patients (73.2%) were 
males and 99 (26.8%) were females. 61 patients (16.5%) out of 
370 had Arrhythmia and rest of 309 (83.5%) did not have 
Arrhythmias. 178 patients (48.1%) were having Hypokalemia. When we cross tabulated gender with arrhythmias, using chi

- 0.001
- 0.007

Discussion

Great progress has been made so far in reducing the 
mortality but a great menace that still exists is sudden cardiac 
death [3]. Different reasons of sudden death are postulated 
including serum potassium imbalance leading to arrhythmia 
[4,5]. Ventricular arrhythmias were found to present in the initial 24 hours of acute MI and heart failure [6]. Hypokalemia 
was found very much related to arrhythmias in patients with 
acute especially in the first 24 hours [3,7].

In our study the frequency of ventricular arrhythmias came 
out only 16.5%. This implies that the ventricular arrhythmias are common in our population presenting with 
acute myocardial infarction. This outcome is comparable with 
international studies. In a previous study, the frequency of 
ventricular arrhythmias in patients with acute MI was found to be 17% [6].
To determine the association between hypokalemia (Serum potassium levels <3.5mEq/L) and ventricular arrhythmias in patients of acute MI, we cross tabulated data. Results were statistically highly significant (p value < 0.001). 39 hypokalemia patients had arrhythmias.

Arrhythmias have been labeled to be a common cause of sudden cardiac death [9,10]. In a developing country like ours, it is mandatory to stratify the patients with greater chances of post myocardial infarction complications so we may prepare our setting for any emergency especially in secondary care hospitals with lesser facilities. It may safely be said that all patients with serum potassium levels <3.5mEq/L at presentation are at risk of developing ventricular arrhythmias after acute myocardial infarction.

In our study population, mean age of the patients was 54.55 ± 9.230 years (range 40 to 70 years). When we cross tabulated age group with arrhythmias, results were non–significant (p value=0.123) that depicted that development of arrhythmias is not dependent on age groups. Similarly, development of ventricular arrhythmias after acute myocardial infarction was independent of gender.

Above results imply that more preventive efforts are required to reduce the burden of ischemic heart disease by controlling risk factors. The only limitation of our study was its cross sectional study design without measuring the terminal outcome like in hospital mortality and major adverse cardiac events.

**Conclusion**

It is concluded that in our sampled population only 61 patients (16.5%) out of 370 had developed ventricular arrhythmias after acute MI. 21.9% patients with hypokalemia developed ventricular arrhythmias after acute myocardial infarction as compared to 11.4% normokalemic patients.

**References**


