

# In-hospital Outcomes of Acute Myocardial Infarction among old patients

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## ABSTRACT

**Aim:** To determine the frequency of in-hospital outcomes of acute myocardial infarction among old patients. **Study design:** Cross-sectional study.

**Methods:** This study was done using non-probability purposive sampling technique at department of Cardiology, District Headquarters Hospital, Layyah. A total 112 patients with AMI having age more than 60 years were registered in this study. Informed verbal consent was taken from each patient before participation. All the obtained data were entered and analyzed in SPSS version 16.

**Results:** A total of 110 patients with AMI aged more than 60 years were included, of these 110 study cases, 73(65%) were males and 39(35%) were females. Mean age of the study cases was  $70.34 \pm 6.49$  years (ranging from 60 years to 84 years). Of these 112 study cases, 36(32.1%) were smokers, 42(37.5%) were hypertensive, 36(32.1%) were diabetic. Arrhythmia was seen in 55(49.1%), anemia in 54(48.21%), Post MI angina was 38(33.9%), Cardiogenic shock in 33(29.5%) and mortality in 15(13.4%) of the study cases.

**Conclusion:** Acute myocardial infarction in elderly patients is associated with poor in-hospital outcomes and high mortality rates. Mortality was significantly associated with female gender and increasing age. Higher frequencies of diabetes, hypertension, anemia and smoking were observed, smoking was significantly associated with male gender while anemia was associated with female gender.

**Keywords:** Myocardial infarction, old patients

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## INTRODUCTION

Myocardial infarction (MI) may be defined as decreased blood supply to the parts of the muscles of heart which lead to necrosis of this specific part of the myocardium<sup>1</sup> and it is leading cause of the morbidity, emergency hospitalizations and deaths worldwide<sup>2,3</sup>. It has been documented that approximately more than 300,000 patients suffer acute ST elevation myocardial infarction every year while other more than 400,000 people suffer non-ST-elevation MI<sup>4</sup> which exerts huge burden on healthcare system.

Moreover, the major proportion of these patients with MI is harbored by middle income countries and male gender preponderance has been well documented as compared to the female patients.<sup>5</sup> Myocardial ischemia as a result of atherosclerotic coronary artery disease (CAD) can lead to the acute myocardial infarction (AMI), unstable angina and/or effort angina in these patients. Acute myocardial infarction is more dangerous and life threatening condition which is leading cause of mortality in any emergency healthcare facility. Although death rates resulting from hospital admissions due to MI have significantly dropped by 30 % in recent years due to

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the availability of advanced support system but yet remains to be high.

In Pakistan, trends show increasing proportions of related risk factors of AMI and ischemic heart disease while more than 18% of our adult population is suffering from hypertension, smoking and tobacco use. Obesity is also increasing in recent years with increasing economic development and due to change in sedentary life – style<sup>6,7,8</sup>. Local statistics show that approximately 100, 000 people in Pakistan out of total 150 million population in 2002 suffered AMI<sup>7</sup>. Modifiable risk factors of acute myocardial infarction may include “Diabetes, smoking, hypertension, hyperlipidemia, sedentary life style, obesity, stress and depression” while non-modifiable risk factors for AMI are “advancing age, male gender, family history of coronary artery disease (CAD), while menopause and personality type being partly modifiable” and some factors which are emerging as new factors include “increased levels of high-sensitivity C-reactive protein (hsCRP)<sup>8</sup>, homocysteine, lipoprotein (a), fibrinogen, D-dimers, Interleukin 6 and myeloperoxidases”<sup>9-12</sup>. With the improvement of social conditions and facilities of healthcare facilities, average life expectancy has increased in our population which is coupled with life style

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modification showing more trends towards sedentary habits. Due to these factors there is increased no. of patients having cardiovascular diseases like AMI and stroke<sup>11,12</sup>.

Although increasing age is one of the well documented risk factor of cardiac diseases leading to poor prognosis and adverse in-hospital outcomes but common practice in most of the studies is to exclude them from such related clinical studies done in patients having cardiovascular disease.<sup>4</sup> However phenomenon through which increased age contributes to mortality yet remains to be unknown so far. In addition, the therapeutic strategies for elderly patients have not been well established. So this study was done to ascertain adverse in-hospital outcomes in old AMI patients.

The objective of the study was to determine the frequency of in-hospital outcomes of acute myocardial infarction among elderly population".

## MATERIAL AND METHODS

A total of 112 patients aged more than 60 years presenting with acute myocardial infarction (AMI) were registered in the descriptive cross-sectional study by using non-probability purposive sampling technique. Informed consent was taken from each patient before being included in this study describing them about study objectives and parameters. AMI was diagnosed as per following criteria "Prolonged chest pain for more than 20 minutes with cardiac enzymes (CKMB) raised more than 4 times upper normal limits measured 4 hours after the onset of chest pain with ECG changes as ST elevation of more than 1mm in more than 2 contiguous leads". The study cases were followed for one week to determine outcome i.e. mortality of the patients during current hospitalization, post MI angina defined as "presence of ischemic chest pain occurring either at rest or during minimal activity after 24 hours or more of an acute MI was deemed as positive" and cardiogenic shock defined as "presence of restlessness, hypotension (b.p<60/40), vasoconstriction (cold and clammy skin), hyperventilation (rapid and deep respiration), rapid and weak pulse and oliguria (urine output<150ml/24 hr) was taken positive" and arrhythmia defined as "presence of any of a group of conditions in which the electrical activity of the heart was irregular or was faster or slower than normal (heartbeat may be too fast (over 100 beats per minute) or too slow (less than 60 beats per minute), and may be regular or irregular"). Patients with previous history of myocardial infarction, ventricular tachycardia, congestive heart failure (CHF), congenital heart diseases, cardiomyopathies and valvular heart

diseases were excluded from the study. Demographic information like age, gender, residential status, socioeconomic status, occupation and level of education were also noted. History regarding diabetes, hypertension, family history of IHD and smoking were also inquired. Patients were diagnosed to be diabetic if they had fasting blood glucose level (FBS) more than 126 mg/dl on 2 different occasions or if they were taking either oral hypoglycemic drugs and/or on insulin therapy for more than 2 years. Hypertension was defined as "Systolic blood pressure (SBP)  $\geq$ 140 mm Hg or a diastolic blood pressure (DBP)  $\geq$  90 mm Hg or known case of hypertension on antihypertensive medications for 2 or more months". All the collected data were entered in Statistical Package for Social Sciences (SPSS-22) and analyzed.

## RESULTS

A total of 112 patients with AMI aged more than 60 years were included, of these 112 study cases, 73(65%) were males and 39(35%) were females. Mean age of the study cases was  $70.34 \pm 6.49$  years (ranging from 60 years to 84 years).

Of these 112 study cases, 36(32.1%) were smokers, 42(37.5%) were hypertensive, 36(32.1%) were diabetic. All the smokers were male patients. Arrhythmia was most common and was seen in 55(49.1%), anemia in 54(48.21%), Post MI angina was 38 (33.9%), Cardiogenic shock in 33(29.5%) and mortality in 15(13.4%) of the study cases.

Fig. 1: Gender distribution(n=112)

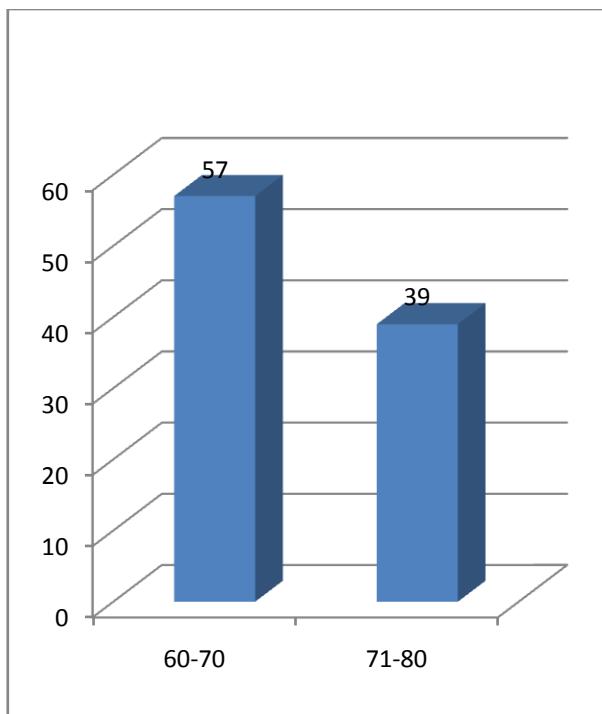


Fig. 2: Age wise distribution of study cases(n=112)

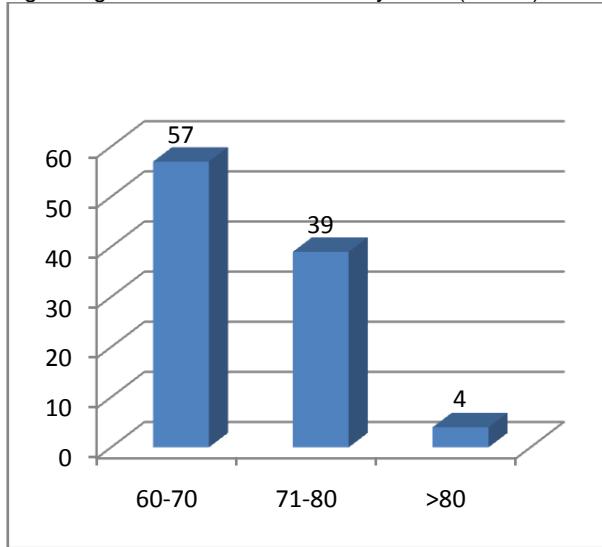


Table 1: Distribution of mortality with regards to gender (n=112)

Gender	Mortality	
	Yes	No
Male (n=73)	4	69
Female (n=39)	11	28

P value=0.002

Table 2: Distribution of anemia with regards to gender (n=112)

Gender	Anaemia	
	Yes	No
Male (n=73)	25	48

Female (n=39)	29	10
P value=0.000		

Table 3: Distribution of cardiogenic shock with regards to gender (n=112)

Gender	Cardiogenic shock	
	Yes	No
Male (n=73)	18	55
Female (n=39)	15	24

P value=0.135

## DISCUSSION

Our study included 112 patients with AMI aged more than 60 years of age to evaluate adverse clinical outcomes among targeted population in this age group. Elderly people are at increased risk of developing "Silent or unrecognized AMI" ultimately leading to the congestive heart failure, cardiac rupture and atrial fibrillation. All these conditions are significantly associated with increased proportion of mortality and poor clinical outcome in these patients. In cardiovascular diseases, age is strong predictor for poor prognosis and mechanism of impact of increasing age on mortality yet remains unknown. Although thrombolytic therapy has been shown to improve survival rate in the elderly patients, treatment strategies of these old patients are not properly established<sup>13, 14</sup>. In literature different studies have associated male gender with acute myocardial infarction. In our study male gender predominated over the female gender as there were 65% male patients and 35% female patients. A study conducted by Leal et al<sup>15</sup> reported 61.4% male patients and 38.4% female patients which are close to our study results. Similar results have been reported by Teresa et al<sup>16</sup>. Shah et al from Pakistan reported male gender predominating over female gender as there were 77% male patients with AMI from elderly age groups<sup>17</sup>.

Mean age of the study cases was  $70.34 \pm 6.49$  years (ranging from 60 years to 84 years). Leal et al<sup>15</sup> reported mean age  $72 \pm 5.3$  years in elderly patients with AMI which is close to our study results. Teresa et al<sup>16</sup> reported similar results. Of these 112 study cases, 36(32.1%) were smokers. A study conducted by Mehta et al<sup>18</sup> from USA reported 27.4% history of smoking in old patients with acute myocardial infarction. These findings are close to our study results. Leal et al<sup>15</sup> reported slightly higher frequency of smoking i.e., 42%. Teresa et al<sup>16</sup> reported 24 % smoking in AMI patients of elderly age groups.

Forty two (37.5%) were hypertensive. Mehta et al<sup>18</sup> reported 31.8% frequency of hypertension which is close to our findings. Teresa et al<sup>16</sup> reported fairly high frequency of hypertension in their study i.e., 59%. 36(32.1%) were diabetic, Mehta et al<sup>18</sup> reported

32.8% frequency of diabetes in their study which is similar to that of our study results. Teresa et al<sup>16</sup> reported 33% diabetes in their study, these results are close to that of our study results. All the smokers were male patients.

Although increasing age is one of the well documented risk factor of cardiac diseases leading to poor prognosis and adverse in-hospital outcomes but common practice in most of the studies is to exclude them from such related clinical studies done in patients having cardiovascular disease.<sup>4</sup> However phenomenon through which increased age contributes to mortality yet remains to be unknown so far. Arrhythmia was most common and was seen in 55(49.1%), anemia in 54 (48.21%), Post MI angina was 38(33.9%), Mehta et al<sup>18</sup> reported 58% post MI angina which is higher than our study results, Cardiogenic shock in 33(29.5%) and. Different studies have reported high mortality rates among old patients with AMI<sup>15</sup> and Mehta<sup>18</sup>, mortality in 15(13.4%) of the study cases, Leal et al reported 18.8 % mortality among elderly people with AMI, mortality was more common in females than male patients, similar findings have been reported by Leal et al<sup>18</sup>. Teresa et al<sup>15</sup> reported 7.9% mortality in old patients of AMI.

## CONCLUSION

Acute myocardial infarction in elderly patients is associated with poor in-hospital outcomes and high mortality rates. Mortality was significantly associated with female gender and increasing age. Higher frequencies of diabetes, hypertension, anemia and smoking were observed, smoking was significantly associated with male gender while anemia was associated with female gender.

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