IN-HOSPITAL OUTCOME OF OCTOGENARIAN PATIENTS WITH ACUTE ST SEGMENT ELEVATION MYOCARDIAL INFARCTION

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ABSTRACT

Background: Acute myocardial infarction (AMI) is one of the most deadly disease of the cardiovascular origen. Older patients are more likely to have a "silent" or unrecognized AMI and to develop heart failure, atrial fibrillation, cardiac rupture, and shock, all of which are associated with increased mortality and a poor prognosis. **Objective:** To determine the frequency of in-hospital outcome of octogenarians with acute ST segment elevation Myocardial infarction. **Methodology:** This cross sectional study was conducted at department of Cardiology, Chaudhary Pervaiz Elahi Institute of Cardiology, Multan from 25th October 2014 to 25th April 2015. 140 octogenarian patients of acute myocardial infarction were included in the study and clinically followed during hospital stay. The outcome variables included were mortatilty, cardiogenic shock, post MI angina and arrhythemia. SPSS version 20 was used for data entry and analysis. **Results:** Mortality was observed in 12 (8.6%) of our study cases, cardiogenic shock was noted in 47 (33.6%), post MI angina was noted in 45 (32.1%) and arrhythmia was noted in 53 (37.9%) of our study subjects. **Conclusion:** High frequencies of arrhythmia, cardiogenic shock and post MI angina have been noted in elderly patients in our study.

Keywords: Acute Myocardial Infarction, Octogenarian, Mortality.

JSZMC 2015;7(1):904-908

INTRODUCTION

Myocardial infarction, is the irreversible necrosis of heart muscle secondary to prolonged ischemia.[1] Myocardial infarction is considered part of a spectrum referred to as acute coronary syndrome (ACS). The ACS continuum representing ongoing myocardial ischemia or injury consists of unstable angina, non–ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI).[2] With increased life expectancy, the population of the elderly is increasing, and cardiovascular disease is the major cause of mortality and morbidity in this age group.[3] Although age itself is a definite high risk factor in cardiovascular disease adverse outcomes, those of extreme age are often excluded from clinical trials of cardiovascular disease.[4] However, the mechanism by which increasing age contributes to mortality remains unknown. In addition, the therapeutic strategies for elderly patients have not been well established. Although thrombolytic therapy has been shown to improve survival in the elderly,[5] but these guidelines can be strictly applied to very elderly population is unclear, given that octogenarian patients are a very high-risk group with a high prevalence of co-morbidities.[6] Despite the thrombolysis and percutaneous coronary intervention (PCI) technology has been developed and progressed with stride during the past 10 years, but most cardiologist are reluctant to manage elderly patients with those more invasive means because of the potential increased risk of death and complications.[7] In a study done by Yaling et al,[8] found in-hospital mortality of 24.7%, cardiogenic shock 12.3%, arrhythmias 6.2% and post-MI angina in 9.9% octogenarian after thrombolytic therapy for acute myocardial infarction.

As older age itself is a high risk for adverse outcome after any cardiac event, so this high risk group must need special attention and management plan compared to other age groups.This study was conducted to determine the frequency of in-hospital outcome of octogenarians with acute ST segment elevation myocardial infarction.

METHODOLOGY

This cross sectional study was conducted from 25th October 2014 to 25th April 2015. After approval from institutional ethical review committee, total number of 140 patients of acute ST segment elevation myocardial infarction between 80-89 years of age

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both sexes admitted to the Chaudhry Pervaiz Elahi Institute of Cardiology, emergency department were included. Patients excluded from study were those with non-ST segment elevation MI, advanced heart failure, history of coronary artery bypass surgery and any contraindication to thrombolytic therapy. Informed written consent was taken from each patient after explaining the methods and aims of study. All patients were given thrombolytic therapy (Injection Streptokinase 1.5 million units over one hour) and each patient was monitored through serial ECGs and echocardiography till discharge from the hospital. In hospital outcomes like mortality, cardiogenic shock, arrhythmias and post-MI angina were noted as present or absent. Statistical analysis was performed using SPSS version 20.0. Mean and standard deviation were calculated for quantitative variables like age and duration of disease. Frequency and percentages were calculated for qualitative variables like gender and in-hospital outcomes, mortality, cardiogenic shock, arrhythmias and post-MI angina. Effect modifiers like age, gender, duration of disease, smoker, hypertension, and diabetes mellitus were controlled through stratifications. Post-stratification Chi square was applied to see their effects on the outcome and p value ≤ 0.05 was considered as significant.

RESULTS

Among the 140 study subjects, 99 (70.7%) were male and 41 (29.3%) were female.

Mean age of our study cases was 83.34 ± 2.62 years (minimum age was 80 years while maximum was 89 years). Study results have also indicated that majority of our cases were in the range of age groups 80 to 85 years i.e. 120 (85.7%).

Mean duration of disease was also inquired from the patients and it was 4.49 ± 2.67 hours (minimum duration was 1 hour while maximum duration of disease was 12 hours). Our study results have indicated that majority of our study subjects. i.e.94 (67.1%) presented between 1 – 5 hours.

Smoking was noted in 62 (44.3%) of cases, hypertension was seen in 67 (47.9%) of cases, diabetes mellitus was noted in 47 (33.6%) of cases.

Mortality was observed in 12 (8.6%) of cases, cardiogenic shocks were noted in 47 (33.6%) of cases, post MI angina was noted in 45 (32.1%) of cases and arrhythmia was noted in 53 (37.9%) of cases. (Table I-III).

Table I: In hospital outcome in cases (n=140)

Outcome	Frequency	Percentage
Mortality		
Yes	12	8.6
No	128	91.4
Cardiogenic Shock		
Yes	47	33.6
No	93	66.4
Total	**140**	**100**
Post MI angina		
Yes	45	32.1
No	95	7.9
Total	**1400**	**100**
Arrhythmia		
Yes	53	37.9
No	87	62.1
Total	**140**	**100**

These in-hospital outcomes of octogenarian patients were stratified with regards to gender, age, smoking, hypertension and diabetes mellitus. (Table II, III, IV, V, VI).

Table II: Stratification of In-hospital outcome with regards to gender(n=140)

In Hospital outcome		Gender		P-value
		Male (n=99)	Female (n=41)	
Mortality	Yes (n=12)	04	08	0.006
	No (n=128)	95	33	
Cardiogenic Shock	Yes (n=47)	28	19	0.050
	No (n=93)	71	22	
Post MI angina	Yes (n=45)	24	21	0.003
	No (n=95)	75	20	
Arrhythmia	Yes (n=53)	34	19	0.250
	No (n=87)	65	22	

Table III: Stratification of In-hospital outcome with regards to age. (n=140)

In Hospital outcome		Age groups (In years)		P-value
		80 - 85 (n=120)	86 - 89 (n=20)	
Mortality	Yes (n=12)	12	00	0.215
	No (n=128)	108	20	
Cardiogenic Shock	Yes (n=47)	47	00	0.000
	No (n=93)	73	20	
Post MI angina	Yes (n=45)	41	04	0.302
	No (n=95)	79	16	
Arrhythmia	Yes (n=53)	49	04	0.086
	No (n=87)	71	16	

Table IV: Stratification of In-hospital outcome with regards to Smoking. (n=140)

In Hospital outcome		Smoking		P-value
		Yes (n=62)	No (n=78)	
Mortality	Yes (n=12)	04	08	0.549
	No (n=128)	58	70	
Cardiogenic Shock	Yes (n=47)	24	23	0.283
	No (n=93)	38	55	
Post MI angina	Yes (n=45)	16	29	0.202
	No (n=95)	46	49	
Arrhythmia	Yes (n=53)	31	22	0.009
	No (n=87)	31	56	

Table V: Stratification of In-hospital outcome with regards to hypertension.(n=140)

In Hospital outcome		Hypertension		P-value
		Yes (n=67)	No (n=73)	
Mortality	Yes (n=12)	04	08	0.372
	No (n=128)	63	65	
Cardiogenic Shock	Yes (n=47)	23	24	0.860
	No (n=93)	44	49	
Post MI angina	Yes (n=45)	29	16	0.011
	No (n=95)	38	57	
Arrhythmia	Yes (n=53)	30	23	0.119
	No (n=87)	37	50	

Table VI: Stratification of In-hospital outcome with regards to Diabetes. (n=140)

In Hospital outcome		Diabetes		P-value
		Yes (n=47)	No (n=93)	
Mortality	Yes (n=12)	08	04	0.021
	No (n=128)	39	89	
Cardiogenic Shock	Yes (n=47)	12	35	0.186
	No (n=93)	35	58	
Post MI angina	Yes (n=45)	20	25	0.084
	No (n=95)	27	68	
Arrhythmia	Yes (n=53)	16	37	0.582
	No (n=87)	31	56	

DISCUSSION

With improvements in health care, the life expectancy of the elderly population has increased. The proportion of octogenarians in the general population is expected to triple by the year 2050.[9] Even though octogenarians constitute an important high-risk subgroup of patients with STEMI, they are frequently under-represented in clinical trials, and advanced age is considered an independent risk factor for the early morbidity and mortality associated with PCI for STEMI.[10,11,12,13] Poorer outcome is influenced not only by extensive coronary artery disease but also by more complex comorbidities. In addition, elderly patients are considered more likely than younger patients to suffer complications following revascularization procedures.[10,14,15] Octogenarians have significant high-risk baseline demographic and clinical features, such as diabetes, hypertension, renal failure, anemia, cardiogenic shock, cognitive dysfunction, peripheral artery disease, longer door to balloon time, higher baseline brain natriuretic peptide, and higher C-reactive protein levels. Further, elderly patients not only have preinterventional characteristics that are high risk for major cardiac events, but also have poor interventional characteristics, including tortuous peripheral arteries, more severe diffuse and calcified coronary artery disease, worse interventional success rates, and lower rates of post-procedural TIMI 3 blood flow and ST-segment resolution.[10]

A total of 140 octogenarians patients after acute ST segment myocardial infarction meeting inclusion

and exclusion criteria of this study were registered. Of these 140 study cases, 99 (70.7%) were male. Similar findings were reported by Fan et al,[14] who reported 84% male gender octogenarians in their study. However, Claussen et al[15] reported 49.6 % male gender in their study which is quite less than our study results. Mean age of cases was 83.34 ± 2.62 years (minimum age was 80 years while maximum was 89 years). Study results have also indicated that majority of our cases were in the range of age groups 80 to 85 years i.e. 120 (85.7%). Mean duration of disease was 4.49 ± 2.67 hours. Our study results have indicated that majority of our study cases i.e. 94 (67.1%) presented between 1 – 5 hours. Smoking was noted in 62 (44.3%) of our study cases while Fan et al [14] reported 35.2 % smoking among such patients. The findings of Fan et al,[14] are similar to that of our study results. Claussen et al,[15] reported 13.1 % smoking in their study which is quite less than our study results. The reason for this quite low smoking rate may be due to the fact that there were more females in their study than male patients while our study included more male patients than female.

Hypertension was seen in 67 (47.9%) of our study cases, while Fan et al,[14] reported 52.2 % hypertension in these cases which is similar to that of our study results. Claussen et al,[15] reported 49.1 % hypertension which is similar to that of our findings. Diabetes mellitus was noted in 47 (33.6%) of our study cases. Fan et al,[14] reported 19.4% diabetic patients in their study, their frequency of diabetes is bit lower than that of ours. Claussen et al,[15] reported 14 % diabetes in their study which is less than our study results.

Mortality was observed in 12 (8.6%) of our study cases. Claussen et al,[15] reported mortality in 16.2 % of the study cases, Fan et al,[11] reported mortality in 2.2% of these cases. Yaling et al,[8] reported mortality of 24.7% which is quite high than observed in our study.

Cardiogenic shock is a complication in approximately 5%–8% of patients presenting with STEMI, and remains the leading cause of death after hospitalization.[10] Cardiogenic shocks were noted in 47 (33.6%) of our study cases while Yaling et al,[8] reported cardiogenic shock in 12.3 % of these cases. This finding was quite less than our study results. Post MI angina was noted in 45 (32.1%) of our study cases and Yaling et al,[8] reported in 9.9 % of their study cases. Arrhythmia was noted in 53 (37.9%) of our study cases. Fan et al,[14] reported arrhythmia in 19.1 % of their study cases, which is less than current study. Yaling et al,[8] reported only 9.9 % arrhythmia in their study.

CONCLUSION

Elderly patients with acute myocardial infarction have poor clinical outcomes, as far as, and arrhythmia,mortality cardiogenic shocks and post MI angina are concerned. Our study results have indicated that mortality, cardiogenic shocks and post MI angina were significantly associated with female gender, Arrhythmia was significantly associated with smoking.

REFERENCES

1. Mallinson T. Myocardial Infarction: focus on first aid. Magazine.2010; 15(15):6-8.
2. Anderson JL, Adams CD, Antman EM, Bridges CR, Califf RM, Casey DE Jr, et al. 2012 ACCF/AHA focused update incorporated into the ACCF/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2013; 61:e179–e347.
3. Lo DKY, Chan CK, Wong JT, Leung KF, Yue CS. Outcomes in octogenarians undergoing percutaneous coronary Intervention. Asian J Gerontol Geriatr. 2011; 6:7–13.
4. Lee KH, Ahn Y, Kim SS, Rhew SH, Jeong YW, Jang SY, et al. Characteristics, In-Hospital and Long-Term Clinical Outcomes of Nonagenarian Compared with Octogenarian Acute Myocardial Infarction Patients. J Korean Med Sci. 2014; 29 (4):527-35.
5. O'Gara PT, Kushner FG, Ascheim DD, Casey DE Jr, Chung MK, de Lemos JA, et al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation. 2013; 127 (4) :362–425.
6. Caballero L, Ruiz-nodar JM, Marin F, Roldan V, Hurtado JA, Valencia J. Oral anticoagulation improves the prognosis of octogenarian patients with atrial fibrillation undergoing percutaneous coronary intervention and stenting. Ageing 2013; 42:70–5.
7. Sakai K, Nagayama S, Ihara K, Ando K, Shirai S, Kondo K, et al. Primary percutaneous coronary intervention for acute myocardial infarction in the

elderly aged ≥75 years. Catheter Cardiovasc Interv. 2012; 79:50–56.

8. Yaling HAN, Yi LI, Quanming JING, Shouli WANG, Xiaozeng WANG. Comparison of interventional and conservative treatment on in-hospital outcomes in elderly patients with acute myocardial infarction. J Geriatr Cardiol. 2005; 2 (1):24-7.

9. Da Costa A, Isaaz K, Faure E, Mourot S, Cerisier A, Lamoud M et al. Clinical characteristics, aetiological factors and long-term prognosis of myocardial infarction with an absolutely normal coronary angiogram; a 3-year follow-up study of 91 patients. Eur Heart J 2001; 22:1459-65.

10 Alpert JS. Myocardial infarction with angiographically normal coronary arteries. A personal perspective. Arch Intern Med 1994; 154:245-56.

11 Larson DM, Menssen KM, Sharkey SW,Duval S, Schwartz RS, Harris J, et al. False-positive cardiac catheterization laboratory activation among patients with suspected ST-segment elevation myocardial infarction. JAMA 2007; 298:2754-60.

12. Centers for Disease Control and Prevention MMWR series on public health and aging. MMWR Morb Mortal Wkly Rep. 2003 ; 52 (6):101–16.

13. Gao L, Liu YQ, Xue Q, Feng QZ. Percutaneous coronary intervention in the elderly with ST-segment elevation myocardial infarction. Clin Interv Aging. 2014; 9:1241–1246.

14. Fan G, Fu K, Jin C, Wang X, Han L, Wang H, et al. A medical costs study of older patients with acute myocardial infarction and metabolic syndrome in hospital. Clin Interv Aging. 2015; 10:329–37.

15. Claussen PA, Abdelnoor M, Kevakkestad KM, Eritsland J, Halvorsen S. Prevalence of risk factors at presentation and early mortality in patients aged 80 years or older with ST-segment elevation myocardial infarction. Vasc Health Risk Manag. 2014; 10: 683–689.