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Clinical profile of acute myocardial infarction in elderly patients: A retrospective analysis

Himanshu Dhiman[1], Akhil Katna[2]
[1] Physician, Civil Hospital, Barsar, Hamirpur, Himachal Pradesh, India
[2] Physician, Civil Hospital, Bhoranj, Hamirpur, Himachal Pradesh, India

Abstract
Background and Aim: The aim of study was to determine the difference in clinical profile and outcome of elderly and young patients with acute myocardial infarction (AMI).
Materials and method: The tertiary care center retrospective observational study included 613 consecutive patients with AMI admitted in the ICCU, in a tertiary care center in North India. There were 328 elderly patients.
Results: Proportion of female sex was significantly higher in elderly patients (33.5% vs. 20.4%; P<0.0001). Time to reach first medical contact and ACS centre after onset of symptoms was significantly higher among elderly patients (P=0.005 and P=0.004). Elderly patients had significantly higher creatinine levels in comparison to younger patients (P<0.0001). Among elderly patients, incidence of diabetes, hypertension, and chronic kidney disease (CKD) was 16.1%, 21.7%, and 4.3% respectively. Incidence of diabetes, hypertension, and chronic kidney disease was not significantly different with younger patients (P>0.05). Our study observed that incidence of mortality among elderly and younger patients was 18% and 5.6% respectively. Incidence of mortality was significantly higher among elderly patients (P<0.0001).
Conclusion: We conclude that the manifestations of AMI are more subtle in the elderly, with different risk factors.

Keywords: Myocardial infarction, age, STEMI

Introduction
The elderly with acute myocardial infarction have been reported to present with more atypical symptoms [1, 2]. AMI is associated with significantly higher mortality in the elderly compared with the young, yet the elderly are treated less aggressively than the young [2].
Because of the increasing burden on health care systems associated with MIs in the elderly, differences in clinical picture, and difficulties in dealing with elderly patients with myocardial infraction (MI), we analyzed the course of AMI in patients hospitalized in the intensive cardiac care unit (ICCU) of the tertiary care hospital.

Methods
A total of 613 patients with MI who underwent coronary angiography between 2015 and 2017 were retrospectively studied.
Diagnosis of acute MI (AMI) was made according to World Health Organization (WHO) guidelines. The patients were included if they had a clinical history of ischemic-type chest discomfort, had changes in electrocardiographic tracings, and there was a change in serum cardiac markers.
Data were recorded from the case record files.
The patients were grouped according to Killip class based on the physical findings at the time of admission. "Class I - Absence of rales over lung fields and absence of third heart sound, Class II - Rales over 50% or less of the lung fields or presence of third heart sound, Class III - Rales over more than 50% of lung fields, and Class IV - Cardiogenic shock).

Statistical analysis
Data were recorded into Microsoft® excel workbook, and exported into SPSS v21.0 (for statistical analysis. Quantitative data were expressed as frequency and percentage, and compared using Chi square test. Quantitative non-normative data were expressed as median [interquartile range], and compared using Mann Whitney U test. P value <0.05 was considered significant.

Results
Baseline characteristics
There were 328 elderly patients. Proportion of female sex was significantly higher in elderly patients (33.5% vs. 20.4%; P<0.0001). Time to reach first medical contact and ACS centre after onset of symptoms was significantly higher among elderly patients (P=0.005 and P=0.004). Elderly patients had significantly higher creatinine levels in comparison to younger patients (P<0.0001) (Table 1).

Table 1: Comparison of baseline characteristics (n=613)

	≤60 years (n=285)	>60 years (n=328)	P value
Female sex, n (%)	58 (20.4%)	110 (33.5%)	<0.0001
Time to reach first medical contact (Min)	420.0 [160.0, 1438.75]	690.0 [235.0, 1802.5]	0.005
Time to reach ACS centre (Min)	652.0 [250.0, 2006.2]	1080.0 [320.0, 2584.0]	0.004
Heart rate on admission	83.1±17.21	83.4±18.3	0.839
Systolic BP (mmHg)	127.9±27.8	126.3±29.4	0.514
Creatinine (mg/dl)	1.02±0.49	1.23±0.70	<0.0001

Co-morbidities
Among elderly patients, incidence of diabetes, hypertension, and chronic kidney disease (CKD) was 16.1%, 21.7%, and 4.3% respectively. Incidence of diabetes, hypertension, and chronic kidney disease was not significantly different with younger patients (P>0.05) (Table 2).

Type of MI and Killip class

Among elderly patients, 55.5% had STEMI while remaining 44.5% had NSTEMI (P=0.342). We observed that severity of Killip class was significantly associated with elderly patients (P=0.002) (Table 3).

Outcome

Our study observed that incidence of mortality among elderly and younger patients was 18% and 5.6% respectively. Incidence of mortality was significantly higher among elderly patients (P<0.0001) (Figure 1).

Table 2: Co-morbidities (n=613)

	≤60 years (n=285)	>60 years (n=328)	P value
Diabetes, n (%)	36 (17.6%)	37 (16.1%)	0.665
Hypertension, n (%)	42 (20.6%)	50 (21.7%)	0.770
CKD, n (%)	4 (2%)	10 (4.3%)	0.257

Table 3: Type of MI and Killip class (n=613)

	≤60 years (n=285)	>60 years (n=328)	P value
Type of MI			
STEMI	169 (59.3%)	182 (55.5%)	0.342
NSTEMI	116 (40.7%)	146 (44.5%)	
Killip class			
I	242 (84.9%)	241 (73.5%)	0.002
II	26 (9.1%)	42 (12.8%)	
III	7 (2.5%)	23 (7%)	
IV	10 (3.5%)	22 (6.7%)	

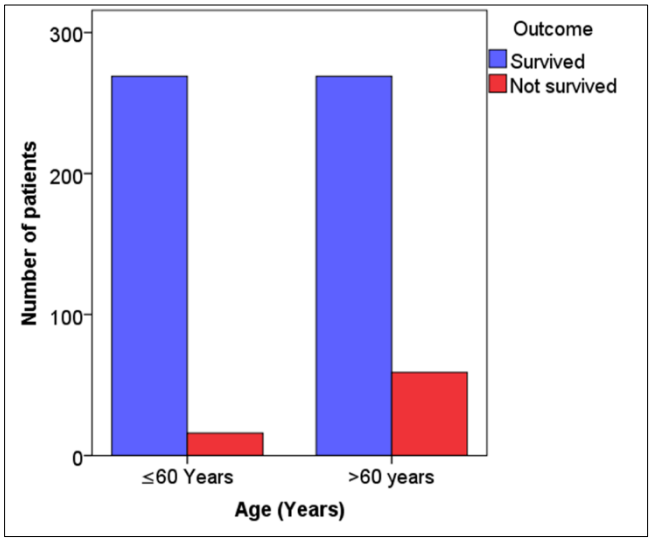

Fig 1: Comparison of outcome of MI

Discussion

The clinical picture of MI in elderly patients differs in many aspects as compared to younger patients. The factors affecting the course of MI in the elderly have not been studied in detail. The present study shows that with increasing age the preponderance of male among patients with AMI admitted to the hospital decreases and sex ratio becomes smaller. This possibly reflects a higher percentage of females in an elderly population and also a very likely a more equal distribution of risk factors for AMI between both genders at high age [3]. This trend was similarly noted in other study populations [4, 5]. One of the possible reasons for this could to be loss of estrogen and its cardio-protective effects in the elderly females [6]. However, the role of hormone replacement therapy to reduce the risk of coronary artery disease in postmenopausal women is still controversial [6].

Older patients are also more likely to have ‘‘silent’’ or unrecognized MIs compared to younger patients. These facts often result in delays in MI diagnosis in the elderly. Time to reach first medical contact and ACS centre after onset of symptoms was significantly higher among elderly patients (P=0.005 and P=0.004). Such trends have been observed previously [7].

As reported in other studies [8], this study also showed that the young patients were more likely to have STEMI (66.66% versus 52.34%) as compared to the elderly patients.

In the present study, the in-hospital mortality in elderly with MI was found to be higher than young. Structural changes of the heart related to the process of aging contribute to a great extent to the high early and late mortality of AMI in the aged. In the aged, the adaptations of cardiovascular system to stress is impaired as a consequence of anatomical, functional and metabolic changes in the heart itself and also increase in impedance to ventricular ejection due to anatomical changes in the arterial bed and insufficient vasodilatory capacity of the peripheral vessels. These ages related changes hamper normal ventricular functions and its adaptive mechanisms to the hemodynamic burden elicited by myocardial necrosis. This explains why ventricular dysfunction occurred more frequently in the very elderly patients before and during an AMI [9]. However age related changes in other organs and deterioration of their adaptive mechanisms to ventricular failure also play a role.

Conclusion

In conclusion, our observations confirmed the differences in the clinical picture of MI between older and younger individuals in many aspects. The elderly present less typical symptoms of MI, which is followed by the significant delay in diagnosis and initiation of the treatment.

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