ORIGINAL RESEARCH PAPER

General Medicine

A HOSPITAL BASED PROSPECTIVE STUDY ANALYSING THE CLINICAL AND PROGNOSTIC DIFFERENCES IN ACUTE MYOCARDIAL INFARCTION IN ELDERLY VERSUS YOUNG

KEY WORDS: Myocardial Infarction, Elderly, Young.

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ABSTRACT

INTRODUCTION:- The normal physiologic and pathologic changes associated with aging make the elderly population vulnerable to cardiovascular diseases irrespective of the presence or absence of the other cardiovascular disease risk factors. The ageing changes can play a determinative role that affects pathophysiology, presentation, and management of Myocardial infarction to be different in elderly as compared to the young.

MATERIALS & METHODS:- The study included 100 cases of acute MI admitted in our hospital with 57 patients in group 1 elderly (age >/= 65 years) and 43 patients in group 2 young (age < 65 years). Data regarding the complete clinical profile of the patient was collected and analysis done by using the Student's t test & SPSS software.

RESULTS:- Around 61% of elderly patients presented to the hospital with atypical symptoms. When compared to the young (11.62%), more percentage of elderly patients (26.3 %) came with cardiogenic shock on admission. Arrythmias post thrombolysis was more in the elderly (35.08% vs 21% in young). The mortality rates following an acute MI were higher among the elderly when compared to the young (33.33% vs 13.9%).

CONCLUSIONS:- Owing to the difference in the risk factors, clinical presentation and the prognosis, treatment of MI in the elderly is difficult and challenging due to comorbidities associated. Considering the subtle features of MI in the older population, a needful watch is necessary in this group of patients so as to decrease the mortality rate due to cardiovascular diseases.

INTRODUCTION:

Cardiovascular diseases (CVD) are the designated leading cause of disease burden and deaths worldwide [1]. The United Nations, alarmed the increasing burden of non-communicable diseases (NCDs) , high disease severity and case-fatality in low-income and middle-income countries as compared to the high-income countries[2]. CVD death rates in India are estimated to have risen from 155.7 to 209.1 per 100,000 between 1990 and 2016, although this number seems to be almost entirely due to population aging[3]. Etiopathogenesis of acute Myocardial Infarction (MI) remains the same as in the younger population – sudden rupture of atherosclerotic plaque followed by thrombus formation in the infarct related artery. Atypical symptoms dominate in elderly as compared with the younger age population. Fatigue or shortness of breath may be the only presenting symptom. Co-existence of co-morbid conditions like diabetes, hypertension, chronic kidney disease , prior MI, CHF and poor myocardial reserve increases the mortality in this elderly subset of population.

Although age-associated changes in cardiovascular structure and function are commonly characterized as "normal," there are intrinsic changes that resemble early disease. Cardiovascular aging and CVD are parts of a spectrum with common molecular links[4]. Multimorbidity, or the presence of "multiple chronic conditions," increases with age and is prevalent in more than 70% of adults aged 75 years or older[5] and it challenges the basic principles of traditional cardiovascular disease management[6]. Evidence-based CVD guidelines which most often rely on investigations are less meaningful when they are applied to clinical circumstances in which multiple diseases and medications are present in older patients.

AIMS AND OBJECTIVES:

- To put forth the importance of subtle features suggestive of myocardial infarction in the elderly and for proper assessment of the cardiovascular diseases.
- To improve the long term outcome of myocardial infarction in the elderly as comparable to that in the younger population.
- To decrease the mortality in myocardial infarction in the geriatric group by early diagnosis and management of the cases.
- Initiating necessary preventive measures with the multiple associated co-morbidities in the elderly which form the important risk factors determining the outcome of the cardiovascular disease.

MATERIALS AND METHODS:

The study was conducted on the acute myocardial infarction patients admitted to our hospital during the duration of 6months. The age of 65 yrs was chosen as the cut off point for the definition of elderly[7]. Patients (> 18 years of age) who presented with complaints suggestive of myocardial infarction and who had ECG changes suggestive of STEMI/ NSTEMI along with elevated cardiac markers and documented regional wall motion abnormality on 2D ECHO were included under the study. Patients with Valvular heart diseases, Hyper-homocysteinemia or other coagulation disorders, Cardiomyopathies, Myocarditis & Pericarditis, Drug abusers, Chronic liver disease, Chronic kidney disease, recently diagnosed and treated MI within 2 years duration, Stable and Unstable angina were excluded. Detailed present, past and treatment history taken, clinical examination done and subjected to all the routine investigations. Patients fulfilling criteria for STEMI and presenting within 12hrs were assessed and were thrombolysed in absence of any contraindications after taking an informed consent. Statistical analyses were performed with Chi square tests for dichotomous data and independent t-tests for continuous data. For all statistical analyses a p-value <0.05 was considered significant. All statistical analyses were conducted using SPSS v.22.

RESULTS:

A total of 100 patients were included in the study which constituted 57 of elderly and 43 of young population. Mean age of elderly was 71 years and that of younger group was 48.8 years. 75% of the elderly and 95% of the younger population presented with STEMI and the rest with NSTEMI. The presenting symptom of a typical chest pain was more common among the younger group when compared to the

elderly (81.3% vs 50.8%, p value<0.001) and in both the groups predominantly females came with atypical symptoms of MI (64% vs 36% in males, p value<0.001). In terms of localization of myocardial infarction, Anterolateral, Inferolateral, Inferior wall MI were among the commonest presentation in both the groups, the difference being insignificant. The mean time duration of presentation to the hospital since the onset of symptoms was 11.82hrs in elderly as compared to 8.44hrs in the younger group (significant at p=0.05) with only 12.2% of the elderly and 53.5% of the younger population reaching the tertiary hospital within 6hrs of onset of symptoms. The distribution of blood pressure upon admission was such that, 26.3% of elderly (vs 11.6% of young) presented with cardiogenic shock whereas a higher percentage of young were found hypertensive as compared to the elderly (48.8% vs 24.5%). Considering the modifiable risk factors in the population under study, smoking and tobacco chewing were the commonest and significant population being males in both the groups. Among the factors predisposing to acute MI, Hypertension (50.9% elderly vs 37.2% young) and Diabetic (47.4% elderly vs 25.6% young, p value< 0.028) were commonest , followed by Stroke and COPD as the other comorbidities. Comparing the percentage of cases thrombolysed among both the groups, 83.7% of younger group underwent thrombolysis as compared to only 45% of elderly which was statistically significant difference (p <0.001). Amongst the contraindications to thrombolysis NSTEMI (14 cases in elderly vs 3 in young), cardiogenic shock (8 in elderly vs 3 in young) and a past history of stroke were the most common.

Among the two groups, 67.43% of the younger population had successful thrombolysis when compared to only 32.5% of the elderly and this difference was statistically significant. Complications post thrombolysis were seen in a higher proportion among the elderly population as compared to the younger group. 29% of total cases being thrombolysed had incidence of shock (19% elderly vs 9.6% young, p value<0.000). In the elderly population, almost 54% of the thrombolysed had acute kidney injury. While the proportion of young going into acute kidney injury after streptokinase (STK) was about 28%. Although very few cases had incidence of life threatening arrythmias post thrombolysis, yet the proportion of the elderly MI being complicated by arrythmias was higher as compared to the younger group (22.8% elderly vs 11.6% young, p <0.035). The proportion of occurrence of life threatening bleeding post STK was more in the elderly as compared to the young (16.12% vs 9.7%, p <0.000). Out of total cases, 44 subjects were on dual antiplatelet therapy due to several indications out of which around 59% of them (26 patients) belonged to the elderly group and the rest belonged to the younger age group.

TABLE NO 1: Distribution of Killip class among the two groups

Killip class distribution of heart failure	Elderly >65yrs	Young < 65yrs
1= no clinical signs of heart failure	10 (17.5%)	7 (16.2%)
2= crepts in lungs, S3 , JVP raised	9 (15.7%)	2 (4.6%)
3= frank pulmonary edema	10 (17.5%)	1 (2.3%)
4= cardiogenic shock	12 (21.1%)	5 (11.6%)

GRAPH NO 1:

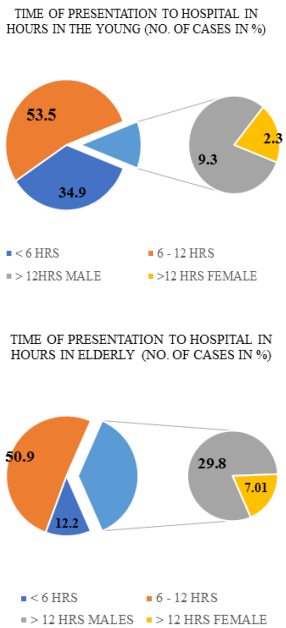

TABLE NO. 2: COMPARISON OF DIFFERENT OUTC OMES (FAIR/POOR/DEATH) POST THROMBOLYSIS

		ELDERLY				YOUNG		
	FAIR	POOR	DEATH	TOTAL	FAIR	POOR	DEATH	TOTAL
THROMBOLYSED	8	12	6	26	29	4	3	36
NOT THROMBOLYSED	6	12	13	31	1	3	3	7
TOTAL	14	24	19(33.33%)	57	30	7	6 (13.9%)	43

80% of the young receiving STK had good outcome compared to just 31% in elderly.

Even post thrombolysis , the mortality rate was higher in the elderly (23%) when compared to the young (8%). Chi square= 21.374, df=4, p=<0.000 (significant)

TABLE NO. 3: Comparing the number of days of hospital stay assuming 5- 7days is the ideal time period for fair outcome in acute MI.

	ELDERLY (no. of cases)	YOUNG (no. of cases)	TOTAL
< 5 DAYS	10	3	13
5- 10 DAYS	35	37	72
10- 15 DAYS	10	3	13
> 15 DAYS	2	0	2
TOTAL CASES	57	43	100

Majority of the younger group (93 %) had a normal duration of hospital stay while 21% of the elderly had a prolonged hospital stay due to associated complications. 17.5% of the elderly population had a very lesser duration of stay which was either due to immediate referral of the patient or due to death.

DISCUSSION:

In our sample size of 100 cases, 57 constituting elderly and 43 younger group, mean age of was 71yrs in elderly , 48.8 in young, with male to female ratio being 0.7:1 in elderly and 3.3:1 in the younger group. This was comparable to a study of clinical profile of acute MI in elderly done by Savith A[8] where the mean age elderly was 69.82yrs although the male to female ratio was 2.57:1, higher than in our study. Similar to our findings the study also reported inferior wall MI, anterolateral wall MI to be the commonest localisation of the infarction.

A study on the similar lines regarding Risk Factors of First Acute Myocardial Infarction: Comparison of Elderly and Non-

Elderly: A 24-Year Study was done by Dabiran, S., Manesh, B.K. and Khajehnasiri, F [9] which revealed, typical anginal chest pain was the most common presenting symptom in both age groups, but more likely in the young than elderly patients (81.76% versus 50.47%; P < 0.05). Atypical chest pain (28% versus 10.75%) or no chest pain (21.49% versus 7.53%) was more commonly observed in elderly group as compared to younger age group (P < 0.05). These findings matched to those observed in our study where 81.3% young came with typical cardiac pain as compared to just 50.8% of elderly (p value < 0.001). While comparing the prevalence of risk factors, of systolic hypertension (p < 0.001) and diabetes mellitus (p = 0.004), were higher in the elderly group than non-elderly group similar to our observations showing 47.4% elderly vs 25.6% young being diabetic (p <0.028).

This study also found the number of elderly subjects arriving within 6 h of chest pain was significantly less as compared to young subjects (51/107 i.e.47.66% Versus 62/93 i.e. 72%, P < 0.05), which was in total agreement with findings of our study as only 12.2% elderly as opposed to 34.9% young came to hospital within 6hrs of chest pain (significant at p=0.05). Assessment of Killip class heart failure presenting at the time of hospitalization revealed that 70 (65.42%) cases from elderly presented with congestive cardiac failure (CCF) as compared to only 34 (36.56%) cases in young, which is statistically significant and was in sync with our observation of 71.8% of elderly vs 34.7% of the young having heart failure. As reported in the study the young patients were more likely to have STEMI (66.66% versus 52.34%) as compared to the elderly patients. This observation was similar to our study showing 95% of younger population as compared 75% of elderly presenting as STEMI. Similar to this study which found that thrombolytic therapy was under used in elderly group only in 27 (39.7%) cases as compared to 44 (63.77%) in young which was statistically significant, our observations too stated the difference in thrombolysis where younger group was subjected to thrombolysis more than the elderly (83.75% vs 45.655, p< 0.001).

Similar difference in thrombolysis was also observed in a study done by Lovleen C. Bhatia , Ruchi H. Naik[10] comparing the clinical profile of acute MI in elderly versus young which observed that thrombolytic therapy under used in elderly group (I) only in 27 (39.7%) cases as compared to 44 (63.77%) in group (II) which was statistically significant (P < 0.05). Rest of patients had contraindications to thrombolytic therapy more so in elderly group but the difference was not found to be statistically significant unlike in our study wherein the reasons for not getting fibrinolytic therapy having NSTEMI, a past history of CVA and presenting to hospital beyond the window period was significantly higher in the elderly.

The incidence of arrythmias (both life threatening VT, VF and the others) during in hospital stay was higher in the elderly when compared to the younger group (54.3% vs 23.2% respectively, p <0.035) which was similar to that observed in a study done by MP Holay, A Janbandhu et al[11].

Comparing the incidence of complications post throm bo lysis, a study conducted by Fabrizio Corsini, Anna Scaglione, Maria Iacomino et al[12] revealed that significantly higher percentage of cerebral haemorrhage after thrombolysis was seen in elderly as opposed to the young (4,9% vs 1,8%) which was similar to our observation of 16.12% elderly vs 9.7% young having post thrombolytic bleeding (p<0.000).

CONCLUSION:

Elderly population should be targeted for better control of hypertension, dyslipidemia and diabetes mellitus, while for the young population, in addition to these, smoking , control of obesity & other risk factors should also be emphasized upon. Since subtleties rather than typical features characterize many of the illnesses (including myocardial infarction) in the elderly, an eye of caution should always be forced upon to recognize such diseases to avoid complications and to prevent mortality. Although it is often less clear that controlling the "risk factors" among older adults reduces the cardiovascular disease events but yet efforts still concentrate on control of modifiable factors known to facilitate development or progression of CVD. And hence regular health screenings which include clinical examination and routine investigations should be carried out to recognize these factors, improve their quality of life and hence achieve successful ageing.

LIMITATIONS OF THE STUDY:

Unavailability of invasive coronary care facilities at our hospital restricted the ideal evaluation and management of acute MI patients especially the cases of NSTEMI.

Patients who were referred to higher centre for additional cardiac care couldn't be followed up accurately so as to consider their prognosis and final outcome.

The long term mortality comparison of acute MI among the two groups wasn't considered in our study.

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