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Original Article

Acute myocardial infarction in young Bangladeshis: A comparison with older patients

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ARTICLE INFO

Article history:

Received 3 June 2014

Accepted 14 October 2014

Available online 6 November 2014

Keywords:

Myocardial infarction

Young

Bangladesh

ABSTRACT

Aim: Youngs with AMI may have unique risk factor, angiographic profile and outcome compared with older.

Methods: Profile of 183 young patients (age ≤ 40 yrs) with AMI admitted to the CCU of Chittagong Medical College Hospital, Bangladesh in one year were compared with 168 older patients of age ≥ 40 years (range 41–70 yrs). Location and types of AMI were determined by ECG and serum troponin- I. Blood for fasting glucose, lipid and a hs-CRP were drawn within 24 hours of admission. CAG was done within 6 weeks of hospital discharge.

Result: Age range of 183 young patients were 21–40 yrs (average 34.21 ± 5.07 yrs). There were 157 male (85.5%) and 26 (14.2%) female (M:F = 6.03:1). Family history of CAD was more common in young (28.6% vs 19.8%, $p < 0.01$). More young patients were smoker (64.5% vs 59.4%, $p < 0.05$). Dyslipidaemia was found more among young (49.7% vs 38.8%, $p < 0.01$). A previous history of angina and MI was less often in younger (17.4% vs 26.7% and 9.2% vs 26.1% respectively). A raised hs-CRP was found more frequently in young (43.6% vs 17.3%, $p < 0.001$). In-hospital mortality was only 3.2% in young compared with 10.7% in older ($p < 0.01$). Echocardiography revealed a lower ejection fraction in the older patients (0.48 ± 0.15 vs 0.51 ± 0.13). CAG revealed lesser degree of coronary lesions in youngs and a higher multivessel CAD among the older.

Conclusion: Young patients presented lately with more dyslipidaemia, positive family history, raised hs-CRP, smoking and had a better in-hospital outcome. Less severe angiographic lesion suggest that early percutaneous coronary interventions may be beneficial.

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1. Introduction

In the threshold of the new millennium CAD is emerging as a new epidemic afflicting people of Indian subcontinent at a relatively young age.¹ On an average, people here develop

myocardial infarction (MI) about 10 year earlier than other populations² and its occurrence in patients under 40 is 5 to 10 fold higher.³ The INTERHEART study showed that the mean age for first presentation of acute MI in the South Asians (Bangladesh, India Nepal, Pakistan, Sri Lanka) is 53 years whereas that in Western Europe, China, and Hong Kong is 63

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years.⁴ These studies suggest that South Asians are at increased risk of MI at a younger age (<40 years). Death and disability due to MI in this productive year of life will greatly strain human and financial resources available to individuals, families and the society as a whole. A number of studies have examined the clinical and coronary angiographic profile of young with evidence of CAD.^{5,6} There is a relative paucity of information concerning the presentation, risk factor, natural history and outcome of young AMI patients compared with older patients with AMI. Increasing number of AMI in young Bangladeshis make it an important clinical problem. Hence the study was done to identify the clinical and angiographic profile of young AMI patients in Bangladesh and compare it with their older counterpart. This may help in defining the target of intervention and formulation of preventive strategies.

2. Methods

The study was carried out in the Department of Cardiology, Chittagong Medical College Hospital, Chittagong, the port city of Bangladesh from June 01, 2012 to May 31, 2013. Profiles of 183 young patients (age ≤ 40 years) admitted with the diagnosis of acute myocardial infarction were compared with 168 older patients (age > 40 years, range 41–70 years) with AMI. Written consent from the patients and clearance from the hospital ethical committee was obtained. Patient profile including age, gender, life style, risk factors for CAD, mode of presentation, duration of symptoms were recorded. Location and types of infarction (STEMI, NSTEMI) were determined by ECG and serum troponin I assay. The criteria for diagnosis of MI were by the presence of at least two of the following⁷: (i) history of typical chest pain > 30 min (ii) characteristic ECG changes – a) > 0.1 mv ST segment elevation or by evolution of pathologic Q of > 0.04 s duration in contiguous leads or c) > 0.1 mv ST segment depression or definite T-wave inversion or both and (iii) the troponin I $>$ twice the upper limit. A person was considered to be hypertensive if he or she was taking antihypertensive treatment or was found to have a systolic blood pressure of ≥ 140 mm Hg or a diastolic blood pressure of ≥ 90 mm Hg at the time of admission and during a repeat measurement when patient is pain free.⁸ Blood for fasting glucose and lipid profile was drawn within 24 h of hospital admission. An individual was considered to be diabetic if he or she was receiving insulin or oral hypoglycaemic agents or had symptoms of diabetes with a random blood glucose > 200 mg/dl or fasting blood glucose of > 126 mg/dl.⁹ Dyslipidaemia was defined when any of the lipid fraction was abnormal for example serum cholesterol > 160 mg/dl or HDL < 35 mg/dl, LDL > 100 mg/dl or triglyceride > 150 mg/dl.¹⁰ High sensitivity testing for C-reactive protein (hs-CRP) was performed by using the CRP latex immunoturbidometric assay (Denka Seiken Tokyo, Japan) having a minimal detectable concentration of 0.03 mg/l.¹¹ A family history was considered positive when symptomatic CAD occurred in siblings, parents, parents siblings or grandparents before 55 in male and 65 in female. The patients were treated with medications according to current recommendations. Thrombolytic therapy with streptokinase was administered within 12 h of onset of their chest pain. A pre-discharge echocardiographic examination to assess LV function was done in all

patients. Coronary angiography was done within a period of 6 weeks of hospital discharge in an attempt to ensure that the coronary anatomy reflects that present at the time of infarction. CAG was possible in 58 young and 39 older patients. Coronary anatomy was described with the use of the criteria of the coronary artery surgery study (CASS).¹²

3. Results

Patient characteristics of the two age groups are shown in Table 1.

A history of angina pectoris was documented in only 17.4% of young AMI patients compared with 26.7% of older patients. A history of previous MI was present in only 9.2% of young patients which is about one third of that found in older patients. Risk factors of CAD in the study populations are shown in Table 2.

A history of smoking, dyslipidaemia, a raised hs-CRP and a positive family history were found significantly more in the young AMI patients.

There was no obvious risk factors for CAD in 21.7% of the young patients compared with that of 17.3% in the older ($P < 0.01$). Twenty one percent of the older patients had three or more risk factors compared with only 14.3% in the young ($P < 0.001$). A history of hypertension and DM was found less in the young patients compared with the older (15.2% vs 22.3% and 26.2% vs 26.1% respectively). Hypertension was the second commonest risk factor in the older age group and was significantly more among them compared with the youngs. The time interval between the onset of chest pain and admission to the CCU are shown in Fig 1.

The mean duration of chest pain and presentation to the CCU was 13.4 ± 4.1 h in the young AMI patients and 9.3 ± 4.4 h in the older patients respectively. Majority of the young AMI patients (55.5%) presented to the CCU after 12 h compared with the older group (17.5%). Types and location of infarction in the two age groups are shown in Fig. 2.

Anterior wall MI accounted for 43.8% and 29.1% in the two groups respectively ($P < 0.001$). Although the frequency of inferior wall MI did not differ significantly between the two groups (39.7% vs 36.2%, P :NS). Non-STEMI were more frequent in older AMI patients (18.2 vs 6.2%, $P < 0.001$) compared with older. In-hospital major complications in the two age groups are shown in Table 3.

Complications occurred less often in young patients. Thirty two percent of young patients had no complications

Table 1 – Patients characteristics in the two age groups.

	Young (n = 183)	Older (n = 168)
Mean age (yrs)		
Male	32 \pm 6.1	54 \pm 4.1
Female	36 \pm 5.2	58 \pm 3.6
Gender		
Male	157 (85.7%)	115 (68.4%)
Female	26 (14.2%)	53 (31.5%)
Male: Female	6.03: 1	3.4: 1
H/O Angina	32 (17.4%)	45 (26.7%)
H/O previous MI	18 (9.2%)	44 (26.1%)

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