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Research Article

Coronary angiographic profile characteristics in young patients with acute coronary syndrome and comparison with older patients with acute coronary syndrome

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ABSTRACT

Background: CAD is a major cause of death worldwide. Indians are prone as a community to CAD at much younger age. This study examined the coronary angiographic profile characteristic in young (<40 year) patients with ACS compared with that in older patients (>60 year).
Methods: 192 patients with ACS aged less than 40 year and 200 patients with ACS aged more than 60 year were included in this study. Coronary angiographic profile characteristics were evaluated in young ACS patients and compared with that in older patients.
Results: Young ACS patients often had angiographically normal coronary arteries, nonobstructive disease and single vessel disease than older patients (p value<0.05).
Conclusions: Angiographically normal coronary arteries, nonobstructive disease, single vessel disease are more frequent in younger patients.

Keywords: Coronary artery disease, Acute coronary syndrome

INTRODUCTION

CAD is a major cause of death worldwide. The risk of CAD in Indians is 3-4 times higher than Chinese and 20 times higher than Japanese.[1-4] Indians are prone as a community to CAD at much younger age.[5-6] Premature CAD is defined as cardiac events occurring before the age of 55 year in men and 65 year in women. CAD in young is defined as cardiac events occurring below the age of 40 year. In the western population incidence of CAD in young is up to 5% as compared to 12-16% in Indians. ACS is less frequent in adult younger than 40 year of age than in elderly adults, but is increasing clinical interest in young adults because of the potential of premature death and long term disability. The mechanism of ACS in young patients is likely different from those in an older population and knowledge of these differences may help to prevent the disease and improve the prognosis. Our study is observational study which analyzes coronary angiographic profile in young ACS patients and compares it from old age ACS patients.

METHODS

192 young patients (<40 year) and 200 old age (>60 year) patients with ACS were selected for study. These patients were admitted to our hospital October 2013 to February 2015.

Inclusion criteria

- Young age (<40 year) ACS patients
- Older age (>60 year) ACS patients

ACS included acute ST segment elevation myocardial infarction (STEMI) or non ST segment elevation myocardial infarction (NSTEMI) or unstable angina (UA). STEMI is defined by symptoms of myocardial ischemia in association with persistent ECG ST segment elevation and subsequent release of biomarkers of myocardial necrosis. ST elevation in at least 2 contiguous leads of ≥2 mm in men or ≥ 1.5 mm in women in leads V2-V3 and/or of ≥1 mm in other contiguous chest leads or the limb leads. New or presumably new LBBB has been considered a STEMI equivalent. UA is diagnosed when there are new or worsening symptoms of ischaemia (or changing symptom pattern) and with or without ECG changes (e.g. ST segment depression or transient elevation or new T wave inversion) with normal level of biomarkers of myocardial necrosis (troponin I). UA and NSTEMI differs primarily in whether the ischaemia is severe enough to cause sufficient myocardial damage to release detectable quantities of marker of myocardial injury.

Exclusion criteria

Patients with following conditions were excluded from study:

Congenital heart disease, cardiomyopathies, myocarditis, Takayasu arteritis, vascular dysplasia, coronary artery embolism, AMI secondary to aortic dissection, severe aortic valve stenosis, myocardial hypertrophy.

Demographic and baseline data were collected by questionnaire at patient's interviews and by review of medical records.

Coronary angiography

Coronary angiography was performed in each and every patient included in study during hospital stay via radial or femoral approach.

Statistical analysis

Continuous variables were presented as mean±SD. The differences between the groups were analyzed by the two sample t test and differences in non-continuous variable between groups were analyzed by chi-square test.

RESULTS

Baseline characteristics

Baseline clinical variables in younger and older men and women with ACS are summarized in Table 1-3. Total number of young ACS patients were 192 (men - 177, women - 15). Mean age was 34.7 year. Total number of older ACS patient were 200 (men-175, women-25). Mean age was 68.6 year (Table 1-3).

Table 1: Baseline characteristics.

Total number of young patients	192
Men	177
Women	15
Total number of old patients	200
Men	175
Women	25

Table 2: Baseline characteristic of young male and older men.

	Men (<40 year) n-177	Men (>60 year) n-175	P value
ACS			
First episode	173 (97%)	149 (84%)	<0.05
Multiple	4 (2.2%)	26 (17.5%)	<0.05
Predominant symptoms			
Asymptomatic	70 (35%)	26 (15%)	<0.05
Heart failure	4 (2%)	10 (6%)	<0.05
Angina	98 (57%)	131 (75%)	<0.05
Arrhythmia	2 (1%)	4 (2%)	<0.05
Other symptoms	3 (1.6%)	4 (2.2%)	<0.05
LV score			
5	38 (22%)	33 (19%)	NS
6-9	58 (33%)	56 (32%)	NS
10-15	61 (35%)	64 (36%)	NS
16+	20 (11%)	22 (13%)	NS
Therapy			
Medical	80 (45%)	26 (15%)	<0.05
Interventional	88 (49%)	62 (35%)	<0.05
Surgical	9 (5%)	87 (50%)	<0.05

Table 3: Baseline characteristics of young female and older female.

	Women (<40 year) n-15	Women (>60year) n-25	P value
ACS			
First episode	14 (93%)	15 (60%)	<0.05
Multiple episode	1 (6.6%)	10 (40%)	<0.05
Predominant symptoms			
Asymptomatic	6 (40%)	3 (8%)	<0.05
Heart failure	1 (7%)	6 (24%)	NS
Angina	8 (53%)	16 (64%)	NS
Arrhythmia	0 (0%)	0 (0%)	
LV score			
5	5 (35%)	8 (33%)	NS
6-9	3 (25%)	6 (27%)	NS
10-15	4 (30%)	7 (29%)	NS
16+	3 (20%)	4 (16%)	NS
Therapy			
Medical	6 (40%)	3 (12%)	<0.05
Interventional	9 (60%)	10 (40%)	<0.05
Surgery	0 (0%)	12 (48%)	<0.05

Table 4: Coronary artery anatomy in young versus old men.

	Men <40Year n-177	Men >60 year n-175	P value
Normal	25 (14%)	3 (2%)	<0.05
Nonobstructive disease	31 (17%)	3 (2%)	<0.05
No. of diseased vessel			
1	91 (51%)	38 (21%)	<0.05
2	16 (9%)	53 (30%)	<0.05
3	14 (8%)	78 (45%)	<0.05

Coronary angiographic data

Analysis of coronary angiograms in the young ACS (men and women) and old ACS patients (men and women) showed that both young men and women had a higher prevalence of angiographically normal coronary arteries and non- obstructive coronary artery disease (p value<0.05). In total, 14% of young men and 26.6% of young women had normal coronary artery compared with 2% and 4% of older men and women respectively (p value-0.05). Young patients were more likely to have single vessel disease, whereas older patients more often had multivessel disease (p value-0.05). The distribution of coronary lesion did not vary significantly with age in either gender (Table 4-6).

Table 5: Coronary artery anatomy in young versus old women.

	Women (<40y) n-15	Women (>60y) n-25	p-value
Normal	4 (26.6%)	1 (4%)	<0.05
Nonobstructive disease	2 (13.3%)	1 (4%)	<0.05
No. of diseased vessel			
1	5 (33.3%)	4 (16%)	<0.05
2	4 (26.6%)	7 (28%)	<0.05
3	0	12 (48%)	<0.05

Table 6: Distribution of CAD in patients with one and two vessel disease.

One vessel disease	Total	LAD	RCA	LCX	p-value
Men					
<40 year	91	63 (70%)	19 (21%)	9 (9.8%)	NS
>60 year	38	19 (50%)	11 (28.9%)	8 (21%)	NS
Women					
<40 year	5	3 (60%)	1 (20%)	1 (20%)	NS
>60 year	4	2 (50%)	1 (25%)	1 (25%0	NS
Double vessel disease					
Men					
<40 year	16 (68%)	11(68%)	11 (68%)	10 (62%)	NS

DISCUSSION

Our study shows a very high frequency of angiographically normal coronary arteries and mildly obstructed coronary arteries than their older counter parts. Young women have a higher frequency of angiographically normal coronary arteries than young men despite an age definition 10 year older. This important finding of our study conforms with the previous prospective and retrospective analysis.[7-10] Of patients <35 year old having described angiographically normal coronary arteries in 9% to 17%.[11,12] Studies of young women <45 to 50 year old have described angiographically normal coronary arteries in 7% to 32%. The actual prevalence of angiographically normal coronary arteries with myocardial infarction has been difficult to determine because some reports have included patients with upto 50% coronary stenosis as well as those free of lumen narrowing. Prospective studies of patients ≤65 year old who underwent coronary angiography after myocardial infarction have found angiographically normal arteries in 0% to 4%.

Young patients with significant coronary obstruction have less extensive disease than older patients .The present finding of predominantly single vessel disease in young patients and multivessel disease in older patients is in accord with previous studies.[16-18]

Many studies have shown LAD to be the vessel most commonly involved followed by RCA and LCX in young patients.[10,17] In comparision with old age ACS patients, our study indicates that the distribution of coronary lesions is not age dependant.

CONCLUSION

Angiographically normal coronary arteries, nonobstructive disease, single vessel disease are more frequent in younger patients.

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