

Research Article

Comparison of conventional risk factors, clinical and angiographic profile between younger and older coronary heart disease patients

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Received: 19 December 2015

Accepted: 06 January 2016

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ABSTRACT

Background: Although numerous risk factors have been established to predict the development of Coronary artery Disease, the risk factor profile may be different between the younger and older individuals. The aim of the study was to compare risk factors, clinical profile and angiographic profile of young and old coronary heart disease patients.

Methods: Patients admitted at cardiac intensive care unit at Sunderam Ahulraj Hospital of south India between January 2012 and December 2013 were classified in to two age groups with 40yrs as cut-off. Patients were assessed for conventional risk factors (diabetes mellitus, dyslipidaemia, hypertension, smoking, and obesity), clinical profile and angiographic profiles.

Results: A total of 100 patients, out of which 32 patients were ≤ 40 yrs of age and 68 patients > 40 yrs of age, were evaluated. Mean age for younger group (< 40 yrs) was 33.56 yrs and for older (> 40 yrs) was 55.39 yrs. Range of age group for study population was 28-72 yrs. The prevalence of obesity, dyslipidaemia, and smoking/ tobacco chewing did not vary significantly between the two groups. Older patients had higher frequency of diabetes (48.5%) and hypertension (41.1%). The most commonly affected coronary artery was the left anterior descending artery among both age groups.

Conclusions: Young patients with Coronary heart disease had different risk profile and less extensive coronary artery disease as compared to older counterparts. Emphasis should be given on diagnosis and management of major modifiable risk factors.

Keywords: Risk factor, Coronary angiography, Coronary artery disease

INTRODUCTION

The coronary artery disease (CAD) is posing a major public health hazard and clinical problem particularly in South Asia. More than half of the worldwide cardiovascular disease risk burden is estimated to be borne by Indian subcontinent by 2020.¹ Further, it is reported that individuals from Indian subcontinent may develop coronary artery disease (CAD) at a higher rate and at an early age.² Onset of CAD before 40 y of age is considered as premature CAD.^{3,4}

Although majority of studies reported that only about 3% of all CAD cases occur in < 40 y of age, it should be considered as the 'tip of the iceberg' as young, asymptomatic patients usually do not undergo medical investigations. The incidence of CAD is reported to be 12–16% among young Indian patients, with more than half of death related to cardiovascular disease occurring in patients below the age of 50 y and one-fourth of acute myocardial infarction cases being reported in patients under the age of 40 yrs.⁵

Although numerous risk factors have been established to predict the development of ACS, this risk factor, profile,

severity of disease and its prognosis may be different between the young and older age groups.⁴

Till date, there is limited information available on risk factors in different age group of patients with CAD from South India. In this regard, we conducted an observational study with an aim to provide an overview of differences and similarities in characteristics and patterns of risk factors and angiographic details between young and old patients with coronary heart disease.

METHODS

Total 100 patients admitted at cardiac intensive care unit at Sunderam Ahulraj Hospital south India between January 2012 and December 2013 were included in study.

Information like age, symptoms, time interval to reach hospital, associated co morbid conditions such as hypertension, diabetes, coronary artery disease, family history, menstrual status, complete clinical examination and treatment details were collected.

Investigations like electrocardiogram, echocardiogram, renal function test, lipid profile were also done. All the patients were followed up during their hospital stay and the outcome recorded.

Operational terms

Typical MI

Chest pain or discomfort, Upper body discomfort, Shortness of breath were considered as typical symptoms.

Atypical MI

Dyspnoea, sweating, fatigue/weakness, light headedness and stomach pain were considered as atypical symptoms.

BMI was considered to categorize patients into the underweight (<18.5), normal (18.5–25), overweight (25–30), and obese (>30) groups.⁶

Hypertension was defined as systolic blood pressure >140 mmHg or diastolic blood pressure >90mmHg or self-report of physician diagnosis of hypertension and/or use of antihypertensive medications.

Diabetes mellitus was defined as fasting blood glucose levels >125 mg/dL or non-fasting blood glucose >200 mg/dL or self-report of physician diagnosis of diabetes mellitus and/or use of antidiabetic medication.

Dyslipidaemia was defined as total cholesterol >200 mg/dL, low-density lipoprotein (LDL) cholesterol >130 mg/dL, high-density lipoproteins (HDL) cholesterol <40 mg/dL or self-report of physician diagnosis of dyslipidaemia and/or use of lipid-lowering medications.

Tobacco use and smoking were defined by the habitual use of tobacco and smoking respectively within two years of presentation at our hospital.

Patients underwent coronary angiography through trans-femoral route to identify stenosis or occlusion in three major coronary arteries or their branches. Based on the angiographic data, patients were divided into those with (a) normal vessels, (b) single-vessel disease, (c) double-vessel disease, and (d) triple-vessel disease. In addition, frequency of involvement of left anterior descending artery (LAD), left circumflex artery (LCx), and right coronary artery (RCA) was analysed.

Statistical analysis

The collected data were analysed using epi info and Primer. Categorical variables were presented as frequency and percentage and the groups were compared by using the Chi-square test or the Fisher's exact test. Continuous variables were described as mean value \pm standard deviation (SD) and were compared by using the Student's t-test to identify statistical differences between the groups. The p-value <0.05 was considered to indicate statistically significant difference between the groups.

RESULTS

A total of 100 patients, out of which 32 patients were \leq 40yrs of age and 68 patients >40yrs of age were evaluated. Mean age for younger group (<40yrs) was 33.56 yrs and for older (>40yrs) was 55.39 yrs. Range of age group for study population was 28-72 yrs (Table 1). Presentation of symptoms did not vary significantly among two groups. Out of 32 younger groups 12(37.5%) showed atypical symptoms and out of 68 older group patients 26 (38.2%) showed atypical symptoms. Older patients had higher frequency of diabetes (48.5%) and hypertension (41.1%), while family history of coronary artery disease was more common among younger patients (37.5%). The prevalence of obesity, dyslipidaemia, and smoking/ tobacco chewing did not vary significantly between the two groups (Table 2).

Table 1: Characteristic of two study group.

Variables	Younger (Age \leq 40yrs) n= 32	Older (Age >40yrs) n=68
Mean age in yrs	33.56	55.39
Age range in yrs	28-40	41-72
Male (n, %)	22 (68.7)	46 (67.6)
Female (n, %)	10 (31.3)	22 (32.4)
Atypical symptoms (n, %)	12 (37.5%)	26 (38.2%)

On clinical diagnosis from ECG finding it was found that anterior wall MI was common among both groups (Table 3). Coronary angiography finding revealed that multi-vessel coronary artery disease was more common among

older group (Table 4). The most commonly affected coronary artery was the left anterior descending artery among both age groups.

Table 2: Comparison of risk factor among two groups.

Variables	Younger (Age ≤40yrs) n= 32	Older (Age >40yrs) n=68	P value*
Family history (n, %)	12 (37.5%)	11 (16.2%)	0.035
BMI >25 (n, %)	16 (50%)	35 (51.4%)	0.938
Hypertension (n, %)	5 (15.6%)	28 (41.1%)	0.021
Diabetes (n, %)	3 (9.3%)	33 (48.5%)	<0.05
Smoking	8 (25%)	17 (25%)	0.804
Tobacco chewing	11 (34.3%)	23 (33.8%)	0.863
Total cholesterol (Mean ±SD)	196.6 ±32.1	196.9 ±32.4	0.966
HDL cholesterol (Mean ±SD)	41.4±9.9	41.7±8.3	0.875
VLDL cholesterol (Mean ±SD)	38.5± 15.8	38.8 ±14.3	0.925
LDL cholesterol (Mean ±SD)	116.2±28.6	116.2±29.2	1
TG cholesterol (Mean ±SD)	194.0±77.3	194.2 ±71.9	0.990

*P value for variable expressed in (n, %) calculated by chi square test and p value for variable expressed in (Mean±SD) calculated by t-test. p value <0.05 was considered as statistically significant difference among two group.

BMI: Body Mass Index, HDL-High Density Lipoprotein, VLDL- Very Low Density Lipoprotein, LDL- Low Density Lipoprotein, TG- Triglyceride.

Table 3: Comparison of clinical diagnosis by ECG among two groups.

Type of MI by ECG	Younger (Age ≤40yrs) n=32	Older (age >40yrs) n=68
ASMI	3 (9.3%)	14 (20.5%)
AWMI	13 (40.6%)	23 (33.8%)
IWMI	6 (18.7%)	18 (26.4%)
IWMI & PWMI	4 (12.5%)	4 (5.8%)
IWMI, RVMI & PWMI	6 (18.7%)	9 (13.2%)

ECG- Electro Cardio Gram, ASMI-Anerioseptal Myocardial Infarction, AWMI-Anterior wall Myocardial Infarction, IWMI-Inferior wall Myocardial Infarction, PWMI-Posterior wall

Myocardial Infarction, RVMI-Right ventricular Myocardial Infarction.

Table 4: Comparison of angiographic findings among two groups.

Angiographic finding	Younger (Age ≤40yrs) n= 22	Older (Age >40yrs) n=44
No vessel Disease	7(31.8%)	3(6.8%)
Single vessel Disease	11(50%)	11(25%)
Double vessel Disease	3(13.6%)	14(31.8%)
Triple vessel Disease	1(4.5%)	16(36.4%)

DISCUSSION

In our study, the youngest patient presented with coronary heart disease was 28 years old, suggesting an early onset of disease and requiring an alarming attention (Table 1). In a study by Prajapati P et al showed the youngest patient presented with ACS was 22-year-old.⁷

Further, the most obvious finding in our study was a very high prevalence of disease among men as compared to women. This male predominance observed in the present study is in line with other studies.^{8,9}

BMI >25 is an alarming concern among both study groups (Table2). The proportion of overweight and obese patients was nearly similar between two age groups. Analysis of other risk factor revealed that dyslipidaemia, smoking and tobacco chewing did not vary significantly between the two groups. In contrast to Family history of CAD was more common among young patients. Diabetes was more among older group than younger one (48.5% and 9.3% respectively). Hypertension was two and half-times more common in older patients than in younger patients.

In our study, in both the age groups were either tobacco chewers or cigarette smoker. While the findings are devastating, it should be emphasized that cigarette smoking and tobacco chewing are reversible risk factors.⁸ Smoking and tobacco chewing have also been traditionally recognized as the most common risk factors for heart disease, particular among young patients.⁵ This is in agreement with other studies of similar nature.^{4,9,10}

The most common anatomical location of the myocardial infarction was anterior wall (40.6% and 33.8% in younger and older groups respectively) trend in types of coronary heart disease reported in the present study is similar to previously published articles.^{3,9-11}

It is widely established that lipid levels are correlated with the extent and the severity of ACS in Asian Indians as in whites, irrespective of age.³We found that mean levels for total cholesterol, LDL cholesterol, HDL

cholesterol, VLDL cholesterol and triglycerides are same among both groups (Table 2). This is contrast finding with literature and other study findings.⁷

Out of 100 patients only 66 underwent coronary angiogram to evaluate the extent of coronary artery disease. Cost, anxiety or not willing to do invasive procedure was reasons for not doing coronary angiogram for rest of the patients.

Analysis of the angiographic pattern revealed that normal or minimal lesion coronary anatomy was more frequent in younger patients (Table 4). There was a preponderance of single vessel disease among young (31.8%) and triple vessel disease older group (36.4%). These findings are in contrast with previously reported literature.¹⁰ This findings may be because of higher prevalence of Diabetes (48.5%) and hypertension (41.1%) among older age groups compared with younger one, which are considered as independent risk factors for CAD. In our patients, LAD was the most commonly involved vessel among both groups. While in a study by Prajapati J et al showed LAD was the most commonly involved vessel among young patients with ACS, while LCx was the most commonly involved vessel among older patients with ACS.⁷ Our findings are in similar with other studies, which showed LAD as the most commonly involved vessel in older patients.^{5,12}

Hence, we highlight that identification and control of potential risk factors is very crucial in the primary and secondary prevention of cardiovascular disease. Dyslipidaemia, diabetes mellitus, hypertension, cessation of smoking and tobacco chewing which have been identified as the major modifiable risk factors in our study.

CONCLUSIONS

Young patients with Coronary heart disease had different risk profile and less extensive coronary artery disease as compared to older counterparts. Emphasis should be given on diagnosis and management of major modifiable risk factors.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Khadkikar GD, Mangudkar SS, Landge JA. Comparison of conventional risk factors, clinical and angiographic profile between younger and older coronary heart disease patients. Int J Res Med Sci 2016;4:567-70.