

Coronary Angiographic Profile of Patients with Acute Coronary Syndrome <45 Years of Age in Rural Population of Tamil Nadu

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Abstract

Background: In India Coronary artery disease manifests almost a decade earlier than in western countries. There are few existing data regarding Coronary angiographic profile of patients less than 45 years of age admitted as Acute Coronary Syndrome, hence this study.

Objective: This study examined the Coronary angiographic profile of young men and women admitted with Acute Coronary Syndrome in our hospital.

Methods: The methodology used was single centre retrospective analysis. 121 patients less than 45 years of age admitted with acute Coronary syndrome were included in the study. All underwent Coronary angiogram within 48 hours of admission.

Results: This is a retrospective study was done from 1st April 2014 to 15th February 2018. Out of 1152 Coronary Angiograms done of patients, there were 121 (10.5%) patients with Coronary angiograms less than 45 years of age. Males were predominant 103/121 (85.1%). The incidence of Single / Double vessel disease was nearly equal (39.6%/35.5%). 22 patients (18.1%) had recanalized coronary arteries (Non-Obstructive CAD). 80 patients (66%) were admitted with diagnosis of acute anterior wall myocardial infarction followed by inferior wall MI 31 (37.8%). Incidence of right dominant system was (80.9%). The predominant vessel involved was the left anterior descending artery (LAD) followed by right coronary artery (RCA). Type A LAD was predominant 95/121 (80.9%). Only 54 patients (44.6%) had discrete Coronary lesions. Proximal LAD / Mid LAD were equally involved. Mid RCA was commonly involved when RCA was the culprit vessel. Distal LCX involvement was more common.

Conclusion: There is equal prevalence of Single vessel disease / Double vessel disease with a lesser prevalence of recanalized Coronary arteries (Non-Obstructive CAD). The severity of acute coronary syndrome seems to be increasing in our population.

Keywords: Coronary artery disease, angiographic profile, acute coronary syndrome, CAD- Coronary artery disease, LAD- Left anterior descending artery, LCX – Left circumflex artery, RCA- Right coronary artery.

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INTRODUCTION

Cardiovascular diseases (CVDs) and its associated complications alone accounts for approximately 12 million deaths annually in the Indian subcontinent.^[1] As per the statistics of the World Health Organization in 2014, 26% of total mortality in India is contributed by CVD.^[2] Mortality

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due to coronary artery disease (CAD) is higher in South India.^[1] Studies carried out in India, and other places suggest that Asians in general and Indians, in particular, are at an increased risk of myocardial infarction (MI) at a younger age (<40 years).

Epidemiologic data collected through various studies also suggested that risk factors may be different in young as compared to older patients,^[3-5] and the clinical presentation of coronary heart disease (CHD) may also vary in these populations. Acute coronary syndrome (ACS) is less frequent in adult younger than 40 years 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.

In contrast to developed countries, where mortality from CHD is rapidly declining, it is increasing in developing countries.^[6] This increase is driven by industrialization, urbanization, and related lifestyle changes and is called epidemiological transition.^[7] This transition affected the developed world, including countries of Europe and North America, in the early 20th century and spread to developing countries 50 years later.^[8]

Due to the high prevalence of CAD in middle age and elderly patients, comparatively few studies have focused on the clinical presentation, treatment, angiographic profile, and outcome of ACS in young patients (<40 years). The young patients with ACS are of particular interest considering the years of potential life lost.

MATERIALS AND METHODS

This retrospective study was conducted from April 1, 2014 to February 15, 2018.

Patients aged 45 years of less admitted to the Cardiology Department, Saveetha Medical College and Hospital with ACS undergoing coronary angiography (CAG) were enrolled in the study after the Institutional Ethics Committee approval. Patients were enrolled if they satisfied the criteria for residence in rural area as per 2011 census guidelines and National Sample Survey Organization. ACS includes ST-segment elevation MI (STEMI), non-STEMI (NSTEMI), and unstable angina. The study population comprised all patients <45 years of age admitted with ACS during this period undergoing CAG.

Exclusion Criteria

1. Age >45years
2. History of prior ACS/Coronary revascularization.

The study identified 121 consecutive patients who meet the inclusion criteria.

Data Collection

Coronary angiograms were visually assessed by two independent observers blinded to the identity and clinical characteristic of the patients.

The angiographic view at end diastole in which the lesion appeared most severe was selected. A computerized quantitative coronary analysis analytical system for lesion quantification available in the cath lab was used to quantify the degree of stenosis. In this study, significant CAD was defined as the presence of at least $\geq 70\%$ stenosis of luminal diameter is at least one of the major epicardial coronary arteries in CAG.

Patients having <70% stenosis were categorized as having non-obstructive CAD. They were further classified, having single-vessel disease (SVD), double-vessel disease (DVD), and triple-vessel disease (TVD). Significant left main disease was defined at least $\geq 50\%$ stenosis of luminal diameters. The management advised by the consultant cardiologist was also recorded.

RESULT

A total of 1152 patients underwent coronary angiogram from April 1, 2014, to February 15, 2018, with a diagnosis of ACS, and 121 patients (10.5%) who were <45 years of age (mean 40 ± 4 years) were enrolled for the study [Figure 1].

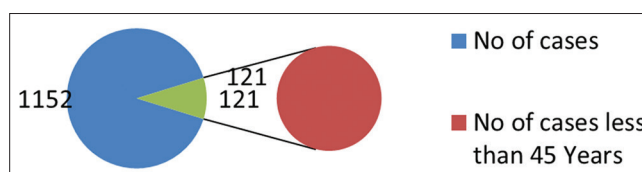


Figure 1: Study population

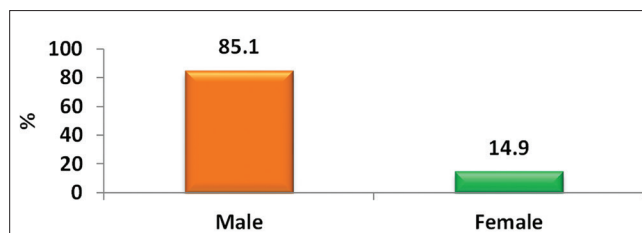


Figure 2: Gender distribution

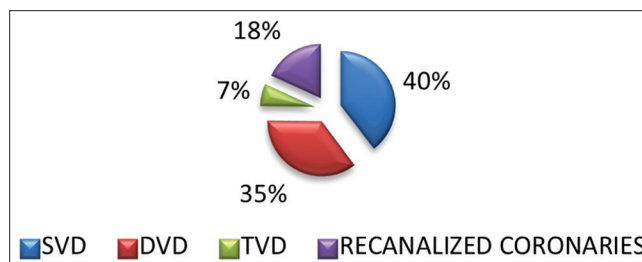


Figure 3: Vessels involved

Majority were males 103 (85.1%) [Figure 2].

Patients had nearly equal incidence of SVD 48 (39.6%) and DVD 43 (35.5%). The incidence of TVD was 8 (6.6%) [Figures 3 and 4].

About 22 (18.1%) patients showed evidence of recanalized coronaries with minimal CAD (non-obstructive CAD). 1 patient had spontaneous dissection of proximal left anterior descending (LAD) (0.8%). Among the stenotic segment of coronary arteries, only 64 lesions were discrete (44.6%) (<10 mm long). Among the ACS patients, the incidence of MI was 80 patients (66.11%), the incidence of NSTEMI was 28 patients (23.14%), and unstable angina 13 patients (10.74%) [Figure 5].

Anterior wall MI was predominant, 46 patients (57.5%), followed by inferior wall MI, 31 patients (38.7%). Only 3 patients (3.7%) presented with isolated lateral wall MI [Figure 6].

Right dominant system was predominant 98 (80.9%) followed by codominant system 16 (13.2%) and then left dominant 7 (5.7%) [Figure 7].



Figure 4: Spontaneous dissection of mid-left anterior descending

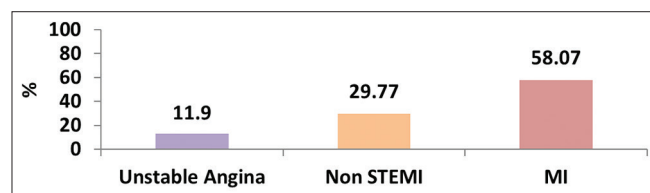


Figure 5: Population of acute coronary syndrome

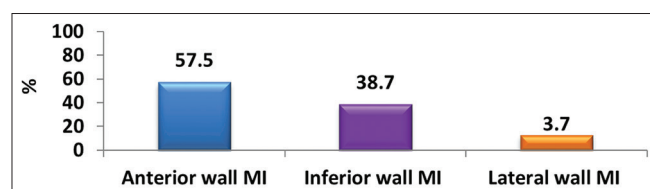


Figure 6: Type of myocardial infarction

Among the coronary arteries, LAD - Type C was predominant 95 (80.9%) followed by Type B 18 (14.8%) and then Type A 13 (10.7%) [Figure 8].

In the coronary arteries with significant proximal LAD stenosis was seen in 27 (38.5%), mid LAD in 27 patients (38.5%), and in distal LAD 10 (14.2%). Diffuse LAD disease was seen in 2 patients (2.8%), and spontaneous dissection of proximal LAD was seen in 1 patient (1.4%) [Figure 9].

When the right coronary artery (RCA) had significant stenosis, proximal RCA was involved in 6 (22.2%), mid RCA 8 (29.6%), and distal RCA 5 (18.5%). RCA was diffusely diseased in 2 patients (7.4%) [Figure 10].

The left circumflex artery (LCX) had significant stenosis involvement of distal LCX was more common 4 (33.3%). Predominant treatment advised was percutaneous transluminal coronary angioplasty 59 (48.7%), medical management 37 (30.5%), and coronary artery bypass grafting 25 (20.6%) [Figure 11].

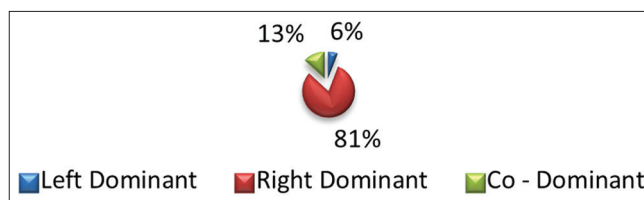


Figure 7: Vessel dominance

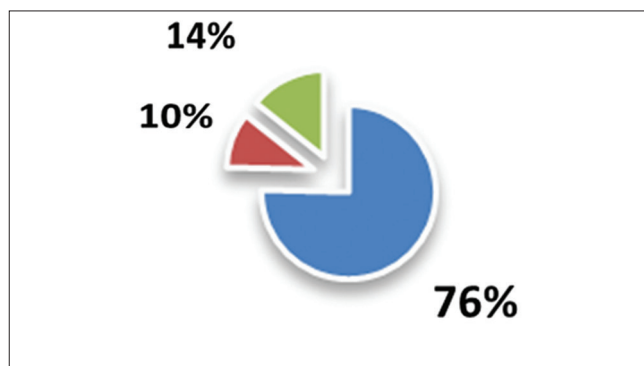


Figure 8: Type of left anterior descending

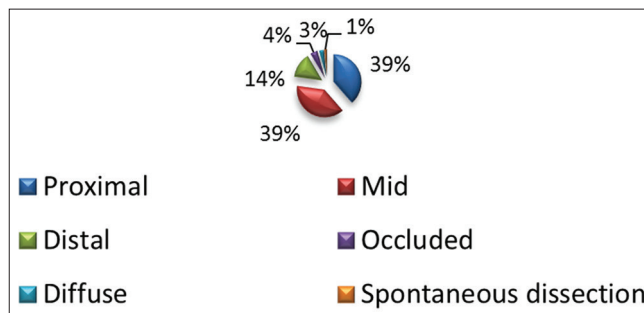


Figure 9: Involvement of left anterior descending

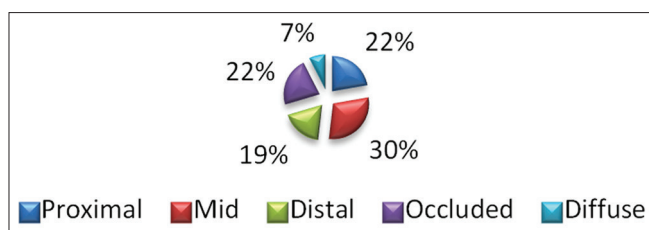


Figure 10: Involvement of right coronary artery

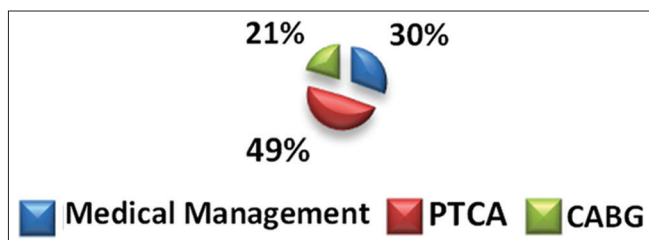


Figure 11: Treatment advised

DISCUSSION

Among 1152 patients who underwent coronary angiogram, 121 patients (10.5%) were <45 years of age, majority were males 103 (85.1%) and 18 (14.9%) were female. In a similar study conducted on 400 patients by Wadkar *et al.*, clinical and angiographic profile of young patients (<40 years) with ACS, in the Department of Cardiology, Lokmanya Tilak Municipal General Hospital, Sion, Mumbai, showed males were 93% whereas female patients were 7%.^[9]

As is in our study, the predilection for the involvement of the LAD artery followed by the right coronary and LCXs has been noted in other reports of young patients.^[10-15]

Increase prevalence of normal coronary artery (18%) and minor coronary abnormalities was found in coronary artery surgery study. SVD was found in 38% of subjects in our study the incidence of SVD was 39.6%.^[15]

Young patients in most studies presented with less number of vessels involved then the older person, but the present study showed more extensive disease in younger patients. This finding may indicate that Indian subjects may have an earlier occurrence of disease process.

The incidence of TVD in our study was each (6.6%) which was in agreement with other studies.^[9]

The incidence of DVD in our study was 43 (35.5%) which was marginally higher than in other studies. Wadkar *et al.*

in the study had reported in incidence of DVD (13.5%). In our study, there was no patient had normal coronaries.

CONCLUSION

There is equal prevalence of SVD/DVD with a lesser prevalence of recanalized coronary arteries (non-obstructive CAD). The severity of ACS seems to be increasing in our population.

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