



## Comparative study of Clinical and Angiographic profile of Elderly versus Younger patients with Coronary Artery disease at a Tertiary Referral Hospital in Rajasthan

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### Abstract

#### Background

Coronary artery disease (CAD) is a major health problem.

#### Aims and Objective

To compare the clinical and angiographic profile of CAD in young and elderly subjects.

#### Methods

Total 100 patients (50 subjects less than 40 years of age and 50 subjects more than 70 years of age) with CAD, undergoing coronary angiogram were evaluated.

#### Results

Younger patients presented more with ST elevation acute myocardial infarction (41.5% vs. 18.4%), whereas elderly patients had increased prevalence of chronic stable angina (27.6% vs. 1.5%) Smokers were more common in younger group (79% vs. 48%) while hypertension (30.7% vs. 18.4%) and diabetes (27.6% vs. 13%) were more commonly detected in elderly subjects with CAD. Higher incidence of family history of CAD was present in the younger age group. On comparing angiographic profile of both groups, younger subjects demonstrated involvement of single coronary vessel while triple coronary vessel disease was common in elderly patients. Stenosis in left anterior

descending artery was present in 58.4% of patients of older group and 44.6% patients of younger group. The involvement of left circumflex and right coronary artery was higher in older age group (29.3% and 44.6%, respectively) than those in younger group (20% and 21.5%, respectively). LMCA was not involved in any younger patient.

#### ■ Keywords

- Coronary artery disease
- Young adults
- Risk factors
- Coronary Angiography

#### ■ Introduction

Coronary artery disease (CAD) is emerging as a major health problem, imposing a significant burden on health care systems because of high morbidity and mortality.<sup>1</sup> The prevalence of CAD has been closely associated with socio-demographic, biological, psychological, and behavioral risk factors.<sup>2</sup> The risk factors and their relative frequency vary in between the older and younger age groups, so does the severity of disease and the prognosis.<sup>3,4</sup> Therefore, understanding the pathophysiology of atherosclerosis spectrum of coronary artery involvement and role of risk factors, in two age groups, is essential for developing strategies for primary and secondary prevention of disease. To date, there is only limited

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information available on the risk factors and angiographic profile of CAD in these different age groups.<sup>4,5,6</sup> Hence, this study was undertaken to provide insight into the entire spectrum of disease from initiation through progression and culminating into overt CAD, so as to reduce the adverse outcome by favorably modifying risk factor and taking best therapeutic measures for their age.

**■ Aim and Objective**

To compare clinical and angiographic profile of elderly versus younger patients with CAD.

**■ Materials and methods**

It was a prospective, observational study conducted at Jawahar Lal Nehru Medical College and Associate Group of Hospitals, Ajmer.

**Grouping of Subjects**

(1) Group-1 (n = 50)

This group consisted of elderly patients >70 years with CAD. Patients of stable angina, myocardial infarction, or unstable angina (2–3 weeks after last episode) were included in this study. Patients with associated valvular heart disease, congenital heart disease, hypertrophic cardiomyopathy, pacemaker rhythm, acute infection, and renal dysfunction were excluded. Informed consent was taken from all the subjects prior to study.

(2) Group-2 (n = 50)

This group consisted of younger patients (<40 y) with coronary artery disease with exclusion criteria similar to group-1.

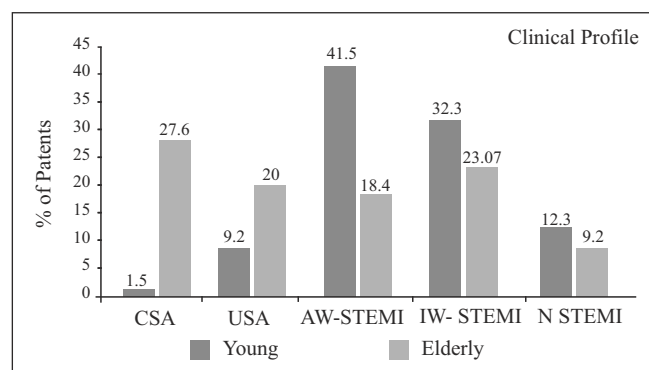
**■ Design of Study**

In all subjects, coronary angiogram was performed by percutaneous radial arterial catheterization. CAD was defined as significant when there was >50% stenosis in the left main artery and >70% stenosis in luminal diameter of left anterior descending, left circumflex, and right coronary artery in various angiographic views taken.

**■ Results**

On comparing the clinical spectrum of CAD between the two groups, the younger patients presented more with ST elevation acute myocardial infarction (41.5% vs. 18.4%), whereas the elderly patients had increased prevalence of chronic stable angina (27.6% vs. 1.5%; Figure-1). Smoking as a risk factor was more common in the younger patients (79% vs. 48%), whereas hypertension (30.7% vs. 18.4%) and diabetes (27.6% vs. 13%) were more commonly detected in elderly subjects with CAD (Table-1). On comparing angiographic profile

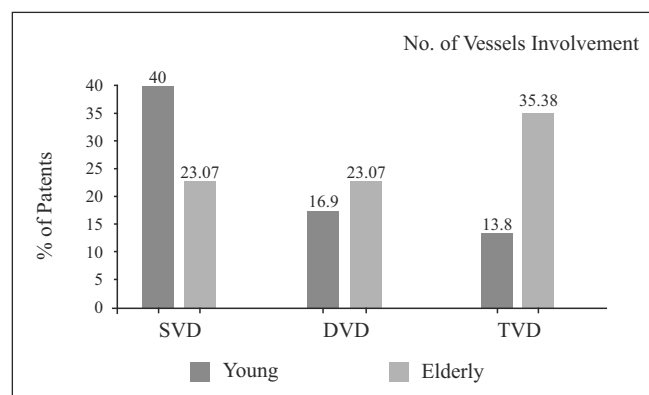
of both groups, younger subjects demonstrated involvement of single coronary vessel, whereas triple coronary vessel disease was common in elderly patients (Figure-2). LAD was most common culprit vessel in the both the groups followed by RCA. LMCA was not involved in any younger patient (Figure-3).



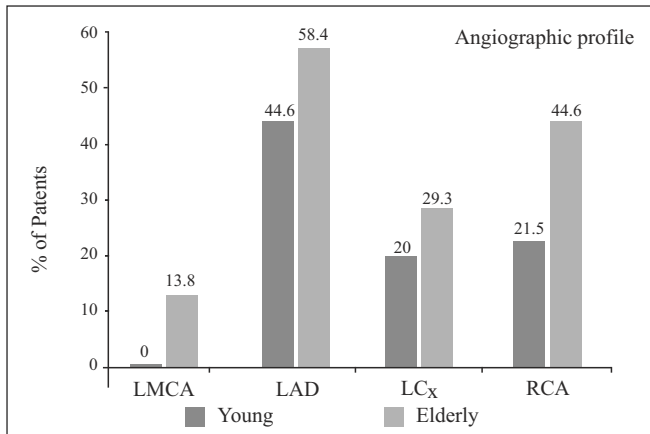
**Figure 1:** Clinical Profile of Study Subjects

**Table 1:** Prevalence of risk factors in Study Subjects

Risk Factors	Young (<40 y) (n=50)	Elderly (>70y) (n=50)
Hypertension	18.4%	30.7%
Diabetes	13%	27.6%
Smoking	79%	48%
Dyslipidemia		
Elevated Cholesterol (>200 mg%)	43%	24%
Elevated Triglyceride (>150 mg%)	55%	23%
Elevated LDL (>100 mg%)	45.2%	37%
Reduced HDL (<40 mg%)	12%	35%
Family History	57%	20%
Depression	20%	70%



**Figure 2:** Coronary Angiographic Profile of Study Subjects



**Figure 3:** Coronary Angiographic Profile of Study Subjects

### ■ Discussion

CAD is an emerging health problem in India associated with high mortality and morbidity. Various risk factors contribute to increased prevalence of CAD in different age groups. Understanding the predominant risk factors among various age groups of the Indian population is important.<sup>7,8</sup> In our study, we observed an age-dependent variation in hazards associated with smoking, with greater relative hazard in the youngest cohort of patients. Platelet activation by cigarette smoking has been linked to thrombosis formation, including onset of myocardial infarction.<sup>9</sup> Approximately 57% younger patients in our study had a positive family history for CAD. Studies have shown that positive family history is a predictor of impaired endothelium-dependent coronary blood flow regulation in human beings.<sup>10</sup> Early detection of CAD in these young individuals is warranted to reduce associated mortality. Nadeem et al., in his study involving a total of 109 young patients of CAD, observed cigarette smoking in 46%, positive family history in 43%, hypertension in 37%, dyslipidemia in 33%, and diabetes mellitus in 18% subjects.<sup>11</sup> The prevalence of diabetes mellitus is approximately 10–15% in different studies conducted in the western world for younger subjects.<sup>12</sup> In our study, the prevalence for diabetes mellitus in CAD in the younger patient group was 13%, but that in elderly patients group was 27.6%. Hyperinsulinemia, insulin resistance, and the higher rate of prevalence of metabolic syndrome in older people with type-2 diabetes attributed to high coronary risk.<sup>13</sup> Hypertension was more prevalent in the older CAD patients (30.7%) when compared to the younger CAD patients (18.4%) and the ratio was nearly 2:1. In the study done by Nesligul et al.,<sup>6</sup> the prevalence was observed to be 47% and 22% in the older and younger CAD patients, respectively. This difference was not significant in the study done by Chen<sup>14</sup> (38% vs. 25%). Its prevalence was similarly found to be 48% in the older CHD patients compared to 28% in the younger CHD

group in the study performed by Wolfe et al.<sup>15</sup> Younger patients were more likely to have an MI as their first event (41.5% vs. 8.4%), whereas chronic stable angina was a more common first event in older patients (27.6% vs. 1.5%). The vessel most commonly involved was the left anterior descending followed by the right coronary artery and the circumflex artery in both the groups and is comparable to other studies.<sup>16,17</sup> Angiographic studies showed that the extent of disease and severity was less in the younger population with comparatively fewer number of coronary arteries affected than that of older age groups, similar to findings reported by Metal et al.<sup>18</sup>

### ■ Conclusion

In conclusion, this study provides important information on age-related differences in the risk factors, clinical profile, and angiographic characteristics of CAD. CAD management requires insight into the entire spectrum of disease manifestation from initiation through progression and culminating into acute illness so as to reduce mortality and morbidity.

### ■ Limitation of the Study

This study was confined to a small population in Rajasthan. Therefore, it is imperative to undertake large population-based, prospective studies. Second, emerging risk factors [lipoprotein (a), triglyceride remnants, lipid subtypes, insulin resistance, C-reactive protein, inflammatory factors] or genetic markers that have been implicated in premature CHD were not studied.

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