e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2022; 14(9); 466-470

Original Research Article

Study of Coronary Angiographic Profile in Young Patients Less than 45 Years of Age with Acute Coronary Syndromes a Single Centre Study from South India

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Received: 16-06-2022 / Revised: 20-07-2022 / Accepted: 30-08-2022
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Conflict of interest: Nil

Abstract

Background: CAD is one of the leading causes of death globally. With increase in incidence of premature Coronary Artery Disease (CAD) in Indians, we planned to assess the angiographic profile in patients aged less than 45 years who presented with Acute Coronary Syndromes in our hospital in Tiruchirappalli from May 2021 to April 2022.

Aims and Objectives: To study the angiographic profile in young patients less than 45 years of age.

Methods: After obtaining consent all patients were subjected to coronary angiogram which was assessed and reported.

Results: Among 172 patients included in this study, majority were males, STEMI (77.32%) was the most common presentation with Anterior wall MI (60.15%) being most common among them. Angiographically, 52.2% patients were found to have Single Vessel Disease.

Conclusion: The increasing occurrence of CAD in younger population necessitates the study of risk factors and pathogenesis of CAD in this population to guide early screening and prevention in this subset.

Keywords: Acute Coronary Syndromes, Coronary Angiography, Young patients

Background

Coronary artery disease (CAD) as a cause has dubious distinction of being responsible for highest mortality all over the world [1]. Epidemiological studies indicate the occurrence of CAD in relatively younger age group in Asian Indians [2].

Though the large studies with respect to younger MI are lacking, available data marks differences in profiles with younger population in having non-traditional risk factors and more prevalence of non-obstructive disease [1].

This study was done to highlight the angiographic profiles of this young population aged less than 45 years presenting with premature ACS.

Methods

The present study was a hospital based single centre retrospective cross sectional study conducted among patients aged ≤ 45 years, who presented in emergency department in Mahatma Gandhi Memorial Government Hospital, Tiruchirappalli, Tamil Nadu during period of May 2021 to April 2022 and were diagnosed and managed on lines of Acute Coronary Syndrome (ACS) on the basis of guidelines laid for diagnosis and management of the same by American Heart Association (AHA)/ American College of Cardiology (ACC).[3] Inclusion criteria included all the patients aged ≤45 years who were presented with ACS and underwent CAG based on ACC/ESC indications for CAG. Those who were ≤45 years of age but underwent CAG for non ACS indication and those with ACS but age >45 years were excluded from the study. All these selected patients had complete hematological and biochemical investigations done. Echocardiograms were done for all the patients and information on Left Ventricular function and Regional Wall Motion Abnormalities were obtained. After obtaining written informed consent, Coronary Angiogram (CAG) was done for all these selected patients using standard percutaneous techniques either via femoral arterial or radial arterial route (after Allen's test). Angiographic severity was assessed in 2 orthogonal views and obstructive CAD was diagnosed was if major epicardial coronary arteries had ≥ 70% or if Left Main Coronary Artery (LMCA) had ≥ 50% occlusion.

Results

This was a cross sectional study which retrospectively studied CAG findings of 172 cases who presented with ACS in form of ST Elevation Myocardial Infarction (STEMI), Non ST Elevation Myocardial Infarction (NSTEMI) or Unstable Angina (UA).

Out of 172 cases studied 140 (81.4%) were males and 32 (18.6%) were females (Fig 1). Of these studied patients, majority of them i.e., 133 (77.32%) patients presented with STEMI, of which 80 (46.51%) cases were contributed by Anterior Wall MI (AWMI) and rest 53 (30.81%) cases were attributed to Inferior Wall MI (IWMI) with or without associated Posterior Wall MI or Right Ventricular MI. Among these 172 patients, 18 (10.47%) patients were diagnosed as NSTEMI and 21 (12.21%) patients presented with UA (Table 1).

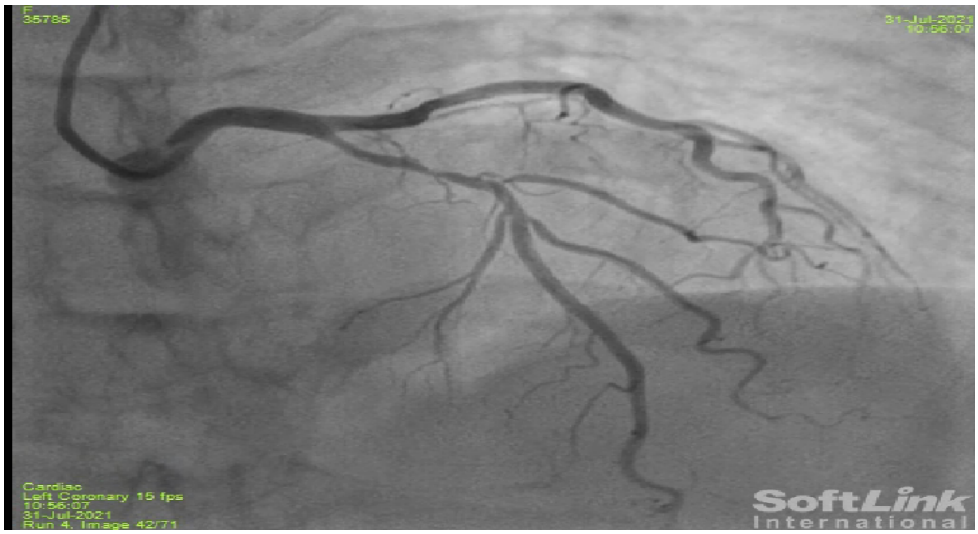

Figure 1

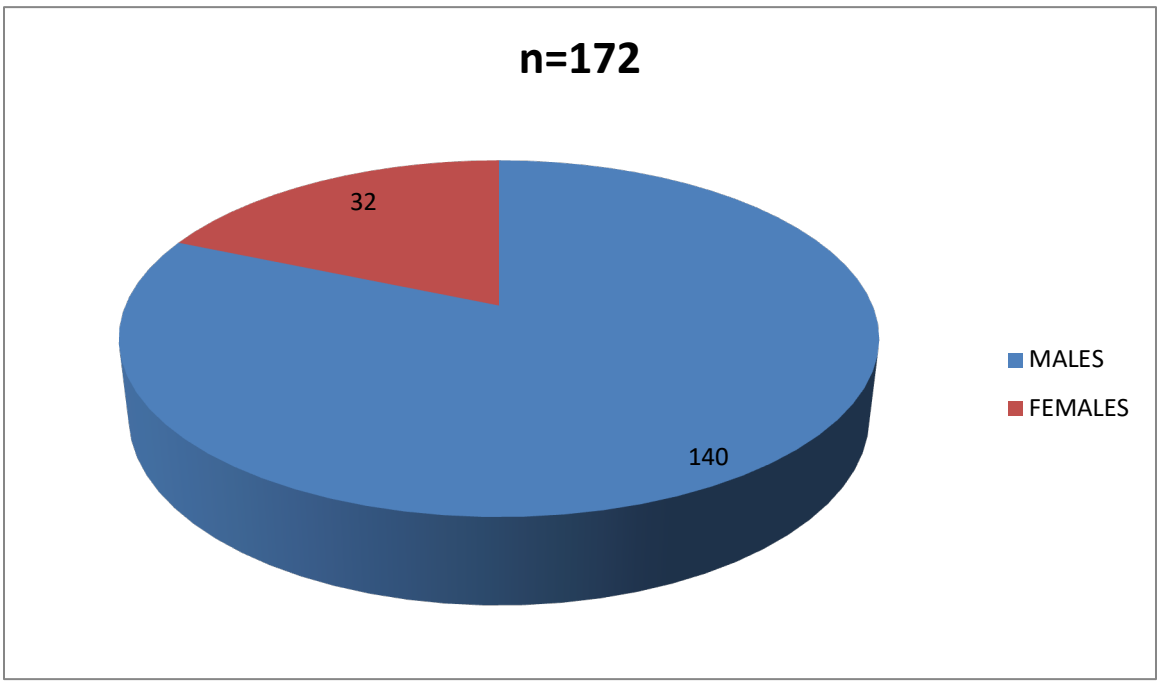

Figure 2: Distribution of patients on basis of gender distribution

Table 1: Distribution on basis of presentation

Acute Coronary Syndrome (ACS)	n=172	Percentage (%)
STEMI	133	77.32
AWMI	80	46.51
IWMI ± RVMI	53	30.81
NSTEMI	18	10.47
UNSTABLE ANGINA (UA)	21	12.21

CAG was done by femoral arterial route in 28 (16.28%) cases and Radial arterial route in 144(83.72%) cases. Of these 172 patients, CAG revealed right dominance in 133 (77.32%) cases and left dominance in 29 (16.86%) cases, while 10 (5.82%) patients had co dominant circulation (Table 2).

Table 2: Angiographic access and profile of the patients

Access and profile	n=172	Percentage (%)
Route chosen		
Radial artery	144	83.72
Femoral artery	28	16.28
Dominance		
Right	133	77.32
Left	29	16.86
Codominance	10	5.82
SVD	90	52.32
DVD	22	12.80
TVD	14	8.14
NORMAL/RECANALIZED	46	26.74

Among these 172 cases, majority i.e., 90 (52.32%) patients were found to have Single Vessel Disease (SVD). Next in frequency were Normal or Recanalized coronaries which were seen in 46 (26.74%) cases. Double vessel disease (DVD) was present in 22(12.80%) patients and Triple Vessel Disease (TVD) was found in 14 (8.14%) cases (Table 2).

Discussion

With the increasing incidence of CAD in young, especially in the Asian Indians, it becomes increasingly essential to study the various characteristics involving the younger population. Our study focussed on one such aspect defining the angiographic extent of the lesions in this younger population. This retrospective observational study included patients with age ≤45 years presenting with ACS. It included 172 patients with age ≤45 years, majority being males, who presented with ACS with most of them having STEMI followed by NSTEMI and UA. AWMI contributed to majority of cases of STEMI with 77.32% patients diagnosed as AWMI. On Angiographic assessment of these patients, SVD topped the list with 52.32% patients having SVD. Recent studies from various parts of world who have studied angiographic profile of the young patients with CAD have revealed varying results which could be attributed to geographic differences and local risk factors. Our results however are concordant with a study done by P.P. Deshmukh *et al* [4] who had similar higher frequency of patients presenting with AWMI and angiographic findings revealing SVD in most of the cases included in their study. Our data is also concordant with the data reported by the studies done in Nepal [5] and Poland [6] which had similar frequency of occurrence of SVD in their study population. The data from the present study, however, must be interpreted considering some limitations. The study does not take into account the study of risk factors which might be different considering the age and geographical distribution. It does not evaluate the characteristic of lesions which may further hint us in the pathogenesis of ACS in this young population.

Conclusion

The increasing occurrence of CAD in younger population and presence of obstructive disease in this subset of patients highlights the need to not overlook the chest pain in young and necessitation of extensive study of risk factors in this population to prevent CAD in this younger population who are the stress bearers and responsibility owners for development of developing nations and sustenance of this development in the developed ones.

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