

Comparison of Angiographic Features of Young and Older Patients Undergoing Primary Percutaneous Coronary Intervention

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ABSTRACT

Aim: To compare angiographic features of young and older patients undergoing primary percutaneous coronary intervention.

Study design: Comparative study

Place and duration of study: Dept of Cardiology, Loralai Medical College & Hospital, Loralai from 1-10-2020 to 31-3-2021.

Methodology: One hundred patients suffering from stenosis and coronary artery diseases were divided into two groups in accordance with their age. Patients with ≤ 40 years were placed in group I while those > 40 years were in group II. The demographic and clinical variables were entered.

Results: The mean age of group I was 34.4 ± 3.9 years while the mean age of group II was 63.2 ± 8 years. There were more males than females in Group I and Group II respectively. The clinical history of both groups showed that obesity, smoking, high cholesterol and low HDL as main comorbidities in group I and group II. Most of the group I had single vessels CAD (SVCAD) 64% while double and triple vessels disease (DVCAD or TVCAD) incidence was similarly high in group II as 36%

Conclusion: There are angiographic variance in young and older adults as number of vessels involved and lesion numbers.

Key words: Coronary arterial disease, Angiographic features, Myocardial infarction

INTRODUCTION

Coronary diseases are one of the major reasons of morbidity over the globe. Although the coronary artery diseases (CAD) are more common at later ages but unfortunately its incidence is ascending in young adults within recent time.¹ Understanding the CAD has become highly important for identification of known factors and their proper treatment or management for saving millions of lives all over the world. Young adults have demonstrated for having different contributing features for CAD development in comparison with older adults. The lifestyle attribution, dietary habits plays a major role in discriminating the angiographic characteristics of both groups of adults^{2,3}.

Various other factors which can lead into CAD include CAD abnormalities, substance-abuse, oral contraceptive hyper usage, and also hyper coagulation condition.^{4,5} Not only the young adults have discriminating features of CAD from older adults but their clinical presentations are also varied. In young adults a frequent abrupt myocardial infarction or unsteady angina are the primary recorded clinical features^{6,7}. The angiographic measurements and studies showed major variance with increased incidence of normal coronary-arteries with mild irregularities in lamina in addition to single vessel-coronary artery dysfunction in young adults than older adults⁸⁻¹⁰. The risk for ischemia and acute MI are highly raised in young adults resulting in sudden death¹¹.

This study was designed for comparing the angiographic features of young adult with older patients suffering from CAD. The outcomes of this study will assist in understating proper management and better health care in both age groups for decreasing morbidity rate associated with coronary heart diseases.

MATERIALS AND METHODS

The study was conducted at Department of Cardiology, Loralai Medical College/Teaching Hospital Loralai from 1st October 2020 to 31st March 2021 after IRB permission. It was a comparative analytical study. All the study participants/ attendants were requested for signing an informed written consent form before enrolment in the study. A total of 100 study participants were divided into two groups. Group I had 50 participants ≤ 40 years of age while Group II had participants > 40 years of age. A well-structured questionnaire was used for recording each patient

demographic, anthropometric, smoking and clinical symptoms. All the inclusive participants had coronary artery disease. Each participant coronary angiographic measurements were taken through angiograms and analyzed. The severity degree of CAD was characterized as minor with stenosis as less than 50% whereas significant with stenosis $> 50\%$, number of diseased vessels, and occluded vessels. Patients who suffered from acute stenosis and diagnosed of having myocardial infarction through pain in chest for a time greater than 30 minutes, elevated ST levels of ≥ 1 mm in greater or equal to 2 adjoining leads or less or equal to twenty four hours: novel left bundle-branch blockage plus from the initiation of symptoms were included in the study. Those patients having past clinical history of stunt were excluded from the study. Data was analyzed by using SPSS-25. Student 't' test and Chi square tools for quantitative and qualitative assessments with p value lower than 0.05 for significance.

RESULTS

The present study enrolled hundred total patients with 50 in each Group I and Group II. The mean age of group I was 34.4 ± 3.9 years with patients between 30-40 years while the mean age of group II was 63.2 ± 8 years with patients between 41-74 years. There were more males in the study than females. There were 84% and 86% males and 16% and 14% females in Group I and Group II respectively (Table 1).

The clinical history of both groups showed that raised BMI, smoking and low HDL were main contributors in causing CAD in group I and group II in addition to increased cholesterol levels. Hypertension (28%) and diabetes (18%) were more common in group II than group I whereas smoking (60%) was more common in young adults (group I) than older adults (36%) (group II) respectively with a significant variance (Table 2).

The angiographic features of group I and group II were compared and analyzed which showed most common infarction related artery as LAD in both groups. Most of the group I had single vessels CAD (SVCAD) 64% while double and triple vessels disease (DVCAD or TVCAD) incidence was similarly high in group II as 36%. One lesion disease was common in 56% of group I while two lesion presentation was noticed in 38% of group II patients (Table 3).

In this study the access site for thrombus aspiration in young adults was radial or ulna in all 50 patients while only one patient in group II was accessed through femoral site and rest through radial (98%) [Fig 1].

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Table 1: Age and gender distribution among cases

Variable	Group I	Group II
Age (years)	34.4±3.9	63.2±8
Males	42 (84%)	43 (86%)
Females	8 (16%)	7 (14%)

Table 2: Clinical characteristics and comorbidities in study cases

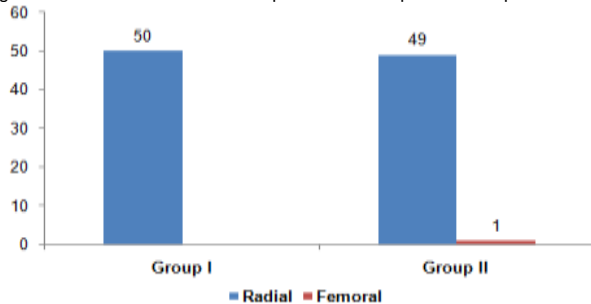
Comorbidities	Group I	Group II	P value
Hypertension	8 (14%)	14 (28%)	0.045
Diabetes	3 (6%)	9 (18%)	0.05
Smoking	30 (60%)	18 (36%)	0.05
BMI>25	27 (54%)	26 (52%)	0.9
Metabolic syndrome	2 (4%)	5 (10%)	0.06
Dyslipidemia			
Low HDL	29 (58%)	21 (42%)	0.04
Raised cholesterol	10 (20%)	27 (54%)	

Table 3: Angiographic features among group I and group II

Angiographic features	Group I	Group II
Artery related to Infarction	LMS	1 (2%)
	LAD	33 (66%)
	RCA	12 (24%)
	LCX	4 (8%)
	Recanalized	2 (4%)
Vessels involved	None	2 (4%)
	SVCAD	32 (64%)
	DVCAD	13 (26%)
	TVCAD	5 (10%)
Lesion length	LAD	30±5.9
	RCA	28±9.9
Lesion numbers	None	2 (4%)
	01	28 (56%)
	02	9 (18%)
	03	6 (12%)
	≥4	5 (10%)

P value <0.05

Fig. 1: Access Site for thrombus aspiration in Group I and Group II



DISCUSSION

Myocardial infarction as a result of CAD can be very lethal if presented in young adults with higher prevalence of morbidity in them. It can not only result in worst outcomes for patient but severe stress and trauma for patient's families. Myocardial infarction with normal angiogram measurements is extremely frequent in all over the world^{12,13}. The ST segment increase in myocardial infarction is more common in young adult than older ones as observed in the present study as well. Majority of the patients in this study were younger than 40 years of age. Many other studies have also published similar findings in patients less than 40 years of age¹²⁻¹⁴.

In this part of the world the number of patients below 40 and having STEMI I is higher than the one reported in western world which elaborates the reason of higher younger morbidity ratio in Asia due to myocardial infarction than west¹⁴.

Factors like hypertension, diabetes, history of smoking, low levels of HDL and obesity plays a major role in increasing the chances of myocardial infarction in young adults. In addition to this study also describes men developing myocardial infarction and

CAD ten years earlier than in women. On the contrary there are few previous studies which have also reported 25% young females suffering from this disease^{15,16}. Association of CAD with smoking, dyslipidemia has been extensively studied and has been reported for its linear relation in various researches over the globe^{17,18}.

Single vessel disease in CAD has been described as most common cause of myocardial infarction in young adults.¹⁹ Similarly, greater number of lesions have been related with increased age in various studies as also presented in current study findings²⁰.

CONCLUSION

Left anterior descending artery was most common infraction related artery. Single vessels CAD in contrast to double vessel CAD are angiographic comparative feature between young and older adults respectively. One lesion disease was common in 56% of group I while two lesion presentations were noticed in 38% of group II patients.

Conflict of interest: Nil

REFERENCES

- Iqbal R, Jahan N, Hanif A. Epidemiology and management cost of myocardial infarction in North Punjab, Pakistan. Iran Red Crescent Med J 2015;17(7):e13776.
- Nadeem M, Ahmed SS, Mansoor S, Farooq S. Risk factors for coronary heart disease in patients below 45 years of age. Pak J Med Sci 2013;29(1):91-96.
- Tsai WC, Wu KY, Lin GM, Chen SJ, Lin WS et al. Clinical characteristics of patients less than forty years old with coronary artery disease in Taiwan: A cross-sectional study. Acta Cardio-logica Sinica 2017; 33(3):233.
- Rajan B, Prabhakaran K. Risk factors and coronary angiographic profile of very young patients with acute myocardial infarction-A tertiary center experience. Stanley Med J2017; 4(1):92-9.
- Shah N, Wang C, Lee V, Cox N, Wong C, Kelly AM, et al. myocardial infarction in young versus older adults: an analysis of differences in proportion, risk factors, clinical demographics, angiographic findings and in-hospital outcomes. Int J Clin Cardiol 2016;3:79.
- Simpsons RW, Edwards WD. Pathogenesis of cocaine induced ischaemic heart disease. Autopsy findings in a 21-year old man. Arch Pathol Lab Med 1986;110(6):479-84.
- Ross GS, Bell J. Myocardial infarction associated with inappropriate use of cocaine for treating epistaxis. Am J Emerg Med 1992; 10(3):219-22.
- Williams MJA, Restieaux NJ, Low CJS. Myocardial infarction in young people with normal coronary arteries. Heart 1998;79:191-4.
- Moreyra AE, Kostis JB, Passannante AJ, Kuo PT. Acute myocardial infarction in patients with normal coronary arteries after acute ethanol intoxication. Clin Cardiol 1982;5(7):425-30.
- Sajid MR, Ansar A, Hanif A, Waheed K, Tufail S. Non Clinical Risk Factors of Myocardial Infarction: A Meta-Analysis Approach. J Biom Biostat 2017;8(4):363
- Tamrakar R, Bhatt YD, Kansakar S, Bhattarai M, Shaha KB. Acute Myocardial Infarction in Young Adults: Study of Risk factors, Angiographic Features and Clinical Outcome. Nepalese Heart J 2014; 10(1): 12-6.
- Hosseini SK, Soleimani A, Karimi AA, Sadeghian S, Darabian S, Abbasi SH, et al. Clinical features, management and in-hospital outcome of ST elevation myocardial infarction (STEMI) in young adults under 40 years of age. Monaldi Arch Chest Dis 2009;72(2):71-6.
- Kanitz MG, Giovannucci SI, Jones JS, Molt M. Myocardial infarction in young adults: Risk factors and clinical features. J Emerg Med 1996; 14:139.
- Nair M, Prabhakaran D: Why do South Asians have high risk for CAD? Global Heart 2012;7(4): 30-14.
- Gupta A, Wang Y, Spertus JA, Geda M, Lorenze N, Nkonde-Price C, et al. Trends in acute myocardial infarction in young patients and differences by sex and race, 2001 to 2010. J Am Coll Cardiol 2014; 29;64(4):337-45.
- Maas A, Appelman Y. Gender differences in coronary heart disease. Neth Heart J 2010; 18(12):598-602.
- Choudhury L, Marsh JD. Myocardial infarction in young patients. Am J Med 1999;107:254-64.
- Pathak V, Ruhela M, Chadha N, Jain S. Risk factors, angiographic characterization and prognosis in young adults presented with acute coronary syndrome at a tertiary care center in North India. BMR Med 2015;1:1-5.
- Andreas W, Dragana R, Jean-Christophe S, Stephan W, Philip U, Gregor N, et al. Acute coronary syndromes in young patients: Presentation, treatment and outcome. Int J Cardiol 2011; 148(3): 300-304.
- Colkesen AY, Acil T, Demircan S, Sezgin AT. Coronary lesion type, location, and characteristics of acute ST elevation myocardial infarction in young adults under 35 years of age. Coron Artery Dis 2008;19(5): 345-7.