ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

ANALYTIC COMPARISON OF PATIENT WITH CARDIAC RISK FACTOR UNDERGOING CORONARY ANGIOGRAPHY IN ACUTE ST ELEVATED MYOCARDIAL INFARCTION

[1] Agarwal Vivek ,

[1] Assistant Professor, Department of Medicine, Geetanjali Medical College and Hospital, Uudaipur, Rajasthan, India, mddrvivek@gamil.com

*Corresponding Author Dr Agarwal Vivek
Assistant Professor, Department of Medicine , Geetanjali Medical College and Hospital , Udaipur , Rajasthan , India mddrvivek@gmail.com

ABSTRACT

Introduction: Acute myocardial infarction is one of the most common causes of death worldwide specially in advancing age. It is uncommon disease in young individual and its incidence varies between 2% and 10%. Lifestyle and dietary changes have lead to obesity, increase level of blood pressure, glucose and cholesterol in younger adults. As a result, these individuals are prone to increased atherothrombotic state. **Methodology:** A descriptive observational study was conducted from September
2015 to December 2016 after approval from institutional ethical committee and written informed consent from patients at Santokba Durlabhji Memorial Hospital, Jaipur. 92 patients with ST segment elevated MI were included in the study.
Socio demographic, clinical, investigation & treatment information were collected. Data obtained were compiled & analyzed using Microsoft Excel and Primer software. **Results:** Out of 92 cases, 79 (85.9%) were male and 13 (14.1%) were female. 34 (37%) cases were in young age group (<45 yrs) and 58 (63%) cases were in older age group (>45 yrs).
AWMI was seen in 38.6% in young age group as compared to 61.4% in age group >45 years. Significant difference is observed in mean thrombus load in young age group (3.79±1.23) and older age group (2.86±1.47). Among the male cases mean
thrombus load was significantly more in young age group (3.80±1.22) as compared to older (2.91±1.41). In female cases also mean thrombus load was high in young (3.67±1.52) as compared to older (2.60±1.77). **Conclusion:** The most common pathophysiology associated with ST elevated myocardial infarction was thrombus. Factors like males, young age, smoking, dyslipidemia, diabetes mellitus, and hypertension had high thrombus load.

KEY WORDS: Myocardial infraction, STEMI .

INTRODUCTION: Acute myocardial infarction is one of the most common causes of death worldwide, and it is more common in person of advancing age.[1] The rate of MI rises sharply in both men and women with increasing age. The proportion of patient with acute coronary syndrome event who have STEMI varies across observation studies from 29% to 47%.[2,3] It is uncommon disease in young individual and its incidence varies between 2% and 10%.[4,5,6] Lifestyle and dietary changes have lead to obesity, increase level of blood pressure, glucose and cholesterol in younger adults. As a result, these individuals are prone to increased atherothrombotic state. Several studies in India suggests substantial morbidity and mortality resulting from CHD. In 1990, 1.18 million people died in India as consequences of CHD; by 2010, this number

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

increased to 2.03 million. CVD probably represent 25% of all deaths in India. Studies also shows that CHD prevalence is higher in men and in urban residents. Prevalence of CHD in India recently was estimated at more than 10% in urban areas and 4.5% in rural areas.[7] Despite advances in diagnosis and management, STEMI remains a major public health problem in the industrialized world and is on the rise in developing countries.

OBJECTIVES: The aim of the study is to compare thrombus load in young (< 45 years) and old (> 45 years) patients with ST segment elevated myocardial infarction.

MATERIALS AND METHODS: A descriptive observational study was conducted from September 2015 to December 2016 at Santokba Durlabhji Memorial Hospital, Jaipur. Sample size was calculated at 81 patients considering prevalence of Coronary angiography with STEMI procedure in the institute be 30%. 92 patients with ST segment elevated MI who have underwent coronary angiogram within seven days of primary event were included in the study. Socio demographic, clinical, investigation & treatment information were collected on a pre-structured performa. Data obtained were compiled & analyzed using Microsoft Excel and Primer software. Approval for study was taken from institutional ethics committee. Written informed consent was taken from each patient.

RESULTS: Out of 92 cases, 79 (85.9%) were male
and 13 (14.1%) were female. 34 (37%) cases were in young age group (<45 yrs) and 58 (63%) cases were in older age group (>45 yrs). 39.2% and 60.8% cases were male in young and older age group
respectively, while 23.1% and 76.9% were female in respective group. 53 (57.6%) were smokers with 43.4% & 56.6% cases in young & older age group. Obesity was seen in 8 (8.7%) cases, 6 (75%) cases were in older age group, while 2 (25%) cases were in young age group. Diabetes was present in 41 (44.6%) cases, 32 (78%) cases were in older age group as compared to 9 (22%) cases in young age group. Hypertension was present in 39 (42.4%) cases, 28 (71.8%) cases were in age >45 yrs as compared to 11 (28.2%) cases in young age group.
45 (48.9%) cases had dyslipidemia in the study. Dyslipidemia is seen in 19 (42.2%) cases were in young age group as compared to 26 (57.8%) cases in age group >45 years. Anterior wall MI was present in 57 (62%) cases, inferior wall MI in 34 (37%) cases and 1 (1%) case was having lateral wall MI.
AWMI was seen in 38.6% in young age group as compared to 61.4% in age group 45 years. Only 22 cases received thrombolytic therapy with streptokinase. 54 (58.7%) cases underwent primary PCI. 32 cases were in age group >45 years and 22 were in young age group. In young age group, 39.7% had single vessel disease, 39.1% had double vessel disease while 18.2% had triple vessel disease. In age >45 years, 60.3% had single vessel disease, 60.9% had double vessel disease, and 81.8% had triple vessel disease.

Significant difference is observed in mean thrombus load in young age group (3.79±1.23) and older age group (2.86±1.47). Mean thrombus load in males is 3.26±1.40 and 2.84±1.72 in females. Among the male cases mean thrombus load was significantly more in young age group (3.80±1.22)
as compared to older (2.91±1.41). In female cases also mean thrombus load was high in young (3.67±1.52) as compared to older (2.60±1.77). Mean thrombus load in smoker was 3.43±1.44 as compared to 2.89±1.41 in non smoker. Mean thrombus load was significantly differ in young smokers (3.96±1.15) & older smokers (3.03±1.54). Mean thrombus load was 3.50±1.41 in obese while it is 3.17±1.45 in non obese. No significant difference is observed within obese as well as with non obese. There is significant difference in mean thrombus load in diabetic group (3.53±1.28) & non – diabetic group (2.94±1.52) as well as in older diabetic group (3.34±1.28) & older non – diabetic group (2.26±1.48). Mean thrombus load was 3.48±1.43 in hypertensive

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

while it is 3.00±1.44 among non hypertensive. Significant difference is noted in older age group, for mean thrombus load in hypertensive (3.34±1.42) and non hypertensive (2.37±1.37). Significant difference was present in mean thrombus load in dyslipidemia patient (3.57±1.21) & non dyslipidemic patients (2.85±1.57) as well as in older dyslipidemia group (3.34±1.26) & older non – dyslipidemia group (2.46±1.52). Mean thrombus load in AWMI was 3.31±1.32 while in IWMI it is 3.02±1.63. Mean thrombus load in thrombolysis group was 3.04±1.52, in PCI group was 3.44±1.31 & in heparin group was 2.62±1.66.

DISCUSSION: In present study mean age was 54.1±14 yrs as compared to study reported by Hiroyuki Jinnouchi et al.[8] (58.6 ±16 yrs), Su-Kiat Chua et al.[9] (61±13 yrs) and Tarek A.N. Ahmed et al.[10] (58±11 yrs). In this study male (85.9%) predominance is seen. Similarly male dominance (80.5%) is seen in study conducted by Hiroyuki Jinnouchi et al.[8]. 43.4% patients with smoking history were young while 56.6% were older. Su-Kiat Chua et al.[9] & Seung Hun Lee et al.[11] reported smoking in 75.8 % & 77.3% in young & 47.2% in older group where as in a study by Hiroyuki Jinnouchi et al.[8] about 40% were smoker. In our study, obesity was seen in 8.7% while Hiroyuki Jinnouchi et al.[8] reported 41.5% overweight. In our study 44.6% were diabetic out of which 22% were young while 78% were old patients. Hiroyuki Jinnouchi et al.[8] & Su-Kiat Chua et al.[9] showed diabetes in 17.2% & 24.5% of young and 47.2% & 31.1% in older group respectively. In our study hypertension is seen in 42.4% out of which 28.2% were young whereas 71.8% were old patients. Su- Kiat Chua et al.[9] & Hiroyuki Jinnouchi et al.[8] showed hypertension in 34.3% & 20.8% of young and 50% & 63.2% in older group respectively. In present study dyslipidemia is seen in 48.9% patients out of which 42.2% were young while 57.8% were old one. Su-Kiat Chua et al.[9] & Hiroyuki Jinnouchi et al.[8] reported results in contrast to ours 28.3% & 56.6% in young whereas 19.9% & 24.8% in old age group. In our study anterior wall MI was present in 62%, inferior wall MI was seen in 37% and only 1% has lateral wall MI. Ratio of young & old patients is 1:2 who are suffering from AWMI & IWMI. Su- Kiat Chua et al.[9] reported AWMI & IWMI in 57.6% & 33.3% young & in 52.3% & 36.5% old group whereas Hiroyuki Jinnouchi et al.[8] showed AWMI & IWMI in 41.5% & 30.2% young & in 46.7% & 35.2% old group respectively. In our study single vessel disease was present in 63%, double vessel disease was seen in 25% and only 12% has triple vessel disease. Ratio of young & old patients is 2:3 who are suffering from single & double vessel disease whereas it is 4:1 in triple vessel disease. Su- Kiat Chua et al.[9] reported similar results while Hiroyuki Jinnouchi et al.[8] reported reversed results in comparison to our results.

Conclusion: The most common pathophysiology associated with ST elevated myocardial infarction was thrombus. Males had high thrombus load and young study population had more thrombus load. High thrombus load was more after associated with smoking, dyslipidemia, diabetes mellitus, and hypertension. AWMI was more commonly seen in study population and also there was significant thrombus load even after thrombolysis. Young age

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

group was more commonly associated with single vessel disease as compared to > 45 years age group.

Table 1: Age-wise distribution of patients

Factors	Age		Total (n=92)	p value (Chi-square test)
	≤45 yrs (n=34)	>45 yrs (n=58)		
Male	31	48	79	
Female	(39.2%) 03	(60.8%) 10	(85.9%) 13	0.42
	(23.1%)	(76.9%)	(14.1%)	
Smoker	23	30	53	
Non-smoker	(43.4%) 11	(56.6%) 28	(57.6%) 39	0.20
	(28.2%)	(71.8%)	(42.4%)	
Obese	02	06	08	
Non-obese	(25%) 32	(75%) 52	(8.7%) 84	0.73
	(38.1%)	(61.9%)	(91.3%)	
Diabetes	09	32	41	
Non-diabetes	(22%) 25	(78%) 26	(44.6%) 51	0.01
	(49%)	(51%)	(55.4%)	
Hypertensive	11	28	39	

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

Non-hypertensive	(28.2%) 23 (43.4%)	(71.8%) 30 (56.6%)	(42.4%) 53 (57.6%)	0.20
Dyslipidemia Non-Dyslipidemia	19 (42.2%) 15 (31.9%)	26 (57.8%) 32 (68.1%)	45 (48.9%) 47 (51.1%)	0.42
AWMI IWMI LWMI	22 (38.6%) 11 (32.4%) 01 (100%)	35 (61.4%) 23 (67.6%) 00 (0%)	57 (62%) 34 (37%) 01 (1%)	0.35
STK+ve STK-ve	06 (27.3%) 28 (40%)	16 (72.7%) 42 (60%)	22 (23.9%) 70 (76.1%)	0.41
Primary PCI+ve Primary PCI- ve	22 (40.7%) 12 (31.6%)	32 (59.3%) 26 (68.4%)	54 (58.7%) 38 (41.3%)	0.50
Single vessel Double	23 (39.7%)	35 (60.3%)	58 (63%)	0.39

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

vessel Triple vessel	09 (39.1%) 02 (18.2%)	14 (60.9%) 09 (81.8%)	23 (25%) 11 (12%)	

Table 2: Comparison of thrombus load

Factors	**N**	**Thrombus load**	**p value (t test)**
≤45yrs >45 yrs	34 58	3.79±1.23 2.86±1.47	0.00

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

Male Female	79 13	3.26±1.40 2.84±1.72	0.34
Smoker Non-smoker	53 39	3.43±1.44 2.89±1.41	0.08
Obese Non-obese	08 84	3.50±1.41 3.17±1.45	0.54
Diabetes Non-diabetes	41 51	3.53±1.28 2.94±1.52	0.05
Hypertensive Non-hypertensive	39 53	3.48±1.43 3.00±1.44	0.12
Dyslipidemia Non-Dyslipidemia	45 47	3.57±1.21 2.85±1.57	0.02
AWMI IWMI LWMI	57 34 01	3.31±1.32 3.02±1.63 3.00	-----
Thrombolysis PCI Heparin	22 54 16	3.04±1.52 3.44±1.31 2.62±1.66	0.11*

* one way ANOVA test

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

Table 3: Age-wise comparison of thrombus load

Factors	**Age**					
	N	**≤45yrs**	**p value (t test)**	**N**	**>45 yrs**	**p value (t test)**
Male	3	3.80±1.2		4	2.91±1.4	
Female	1	2	0.86	8	1	0.55
	0	3.67±1.5		1	2.60±1.7	
	3	2		0	7	
Smoker	2	3.96±1.1		3	3.03±1.5	
Non-smoker	3	5	0.26	0	4	0.35
	1	3.45±1.3		2	2.67±1.3	
	1	7		8	8	
Obese	0	3.00±1.4		0	3.66±1.5	
Non-obese	2	1	0.35	6	0	0.16
	3	3.84±1.2		5	2.76±1.4	
	2	2		2	5	
Diabetes	0	4.22±1.0		3	3.34±1.2	
Non-diabetes	9	9	0.23	2	8	0.00
	2	3.64±1.2		2	2.26±1.4	
	5	5		6	8	

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

Hypertensive	10	3.90±1.44	0.75	29	3.34±1.42	0.01
Non-hypertensive	24	3.75±1.15		29	2.37±1.37	
Dyslipidemia	19	3.89±1.10	0.59	26	3.34±1.26	0.02
Non-Dyslipidemia	15	3.66±1.39		32	2.46±1.52	
AWMI	21	3.71±1.18	-----	36	3.08±1.36	0.15
IWMI	1	3.00				
LWMI	1	3.92±1.32		2	2.50±1.59	
	20	2		2	9	
	01	3.00				
Thrombolysis	06	3.16±1.32	0.08*	16	3.00±1.63	0.42*
PCI	22	4.13±1.03		32	2.97±1.28	
Heparin	06	3.16±1.47		10	2.30±1.77	

* one way ANOVA test

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

Table 4: Age-wise comparison of thrombus load among risk factors

Factors	Age				p value (t test)
	N	≤45yrs	N	>45 yrs	
Male	31	3.80±1.22	48	2.91±1.41	0.01
Smoker	23	3.96±1.15	30	3.03±1.54	0.02
Obese	02	3.00±1.41	06	3.66±1.50	0.61
Diabetes	09	4.22±1.09	32	3.34±1.28	0.07
Hypertensive	10	3.90±1.44	29	3.34±1.42	0.29
Dyslipidemia	19	3.89±1.10	26	3.34±1.26	0.14

REFERENCES:

1. Fournier J, Sanchez A, Quero J, Fernandez- Cortacero J, González-Barrero A: Myocardial infarction in men aged 40 years or less: a prospective clinical-angiographic study. *Clin Cardiol* 1996, 19(8):631-636
2. Garoufalis S, Kouvaras G, Vitsias G, Perdikouris K, Markatou P, Hatzisavas J, Kassinos N, Karidis K, Foussas S: Comparison of angiographic findings, risk factors, and long term follow-up between young and old patients with a history of myocardial infarction. *Int J Cardiol* 1998, 67(1):75-80.
3. Seyed KianooshHosseini, Abbas Soleimani, et al. Clinical features , management and in hospital outcome of ST elevation Myocardial Infarction in young adult under 40 yrs of age. Monaldi *Arch chest Dis*. 2009 ; 72;71-76.

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE 2, 2025

4. Sianos G, Papafaklis MI, Serruys PW. Angiographic thrombus burden classification in patients with ST segment elevation MI treated with PCI. J. *invasive cardiol*. 2010;22:6B-14 B.

5. Su-Kiat Chua; Huei Fong Hung et al; Acute ST elevation Myocardial Infarction in young patient; 15 yrs of experience in a single centre; *clin. Cardiol*. 33, 3, 140-148 (2010).

6. Sorin C Danciv, Fahad M. Iqbal et al.Metabolic syndrome in younger patients with acute coronary syndrome; *Eur J. Gen Med*. 2012; 9(1) 22-26.

7. Choudhury L, Marsh JD. Myocardial infarction in young patients. *Am J Med*. 1999;*107*:254–261

8. Jinnouchi H, Sakakura K, Wada H, et al. Clinical features of myocardial infarction in young Japanese patients. *Int Heart J.* 2013;54:123–128

9. Su-Kiat Chua; Huei Fong Hung et al; Acute ST elevation Myocardial Infarction in young patient; 15 yrs of experience in a single centre; *clin. Cardiol*. 33, 3, 140-148 (2010).

10. Tarek AN Ahmed, Bastiaan J. Sorgdrager, Suzanne. C. Cannegieter, et al: pre infarction angina predicts thrombus burden in patients admitted for ST segment elevation Myocardial Infarction.

11. Seung Hun Lee, Ju Han Kim, Myung Ho Jeong, et al; Clinical characteristics and outcomes of acute ST segment elevation Myocardial Infarction in younger Korean adults; *Korean Circ. J*. 2015 Jul: 45(4): 275-284