Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL 15, ISSUE 3, 2024

A STUDY OF COAGULATION DISTURBANCES IN PATIENTS OF ACUTE CORONARY SYNDROME.

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Received 18 Feb **Accepted 25 Feb** **Published 04 March**

Abstract : We conducted a single center prospective study in 208 patients admitted in a tertiary care center with the complaint of Acute coronary Syndrome .Their coagulation disturbances were corelated with their eventual diagnosis of either Myocardial Infarction or Unstable Angina Pectoris .A significant association was found in the cases of MI and Fibrinogen levels , while no significant role of either PT or APTT was noted.

Keywords : Myocardial Infarction , Unstable Angina Pectoris,Acute Coronary Syndrome , Coagulation ,Fibrinogen

Introduction

The term acute coronary syndrome (ACS) has evolved as an operational term to refer to any constellation of clinical syndromes that are compatible with acute myocardial ischemia. It encompasses acute myocardial infarction (AMI) as well as unstable angina pectoris (UAP) [1,2].As initiation of clotting plays a pivotal role in the pathogenesis of ACS[3,4], measurement of activation of coagulation may predict myocardial ischemia before myocardial necrosis occurs.[5,6] Coronary heart disease (CHD) is a global health epidemic that contributes to more than 7 million deaths per year and is the most frequent cause of death worldwide[3].

The aim of this study is to determine if an accurate assessment of the coagulation profile may assist the clinicians in their diagnosis of Myocardial Infarction as well as Unstable Angina Pectoris in patients presenting in the Emergency Room, when ECG findings are inconclusive. [7,] Time is of essence in the treatment of ACS, and if the coagulation profile supports the diagnosis, timely intervention may prevent or limit myocardial injury. An assessment of coagulation markers is usually already included in most centers at the time of admission in case of ACS. These relatively easy and quick tests may be of significant assistance in cases of nondiagnostic ECG in cases of Myocardial Infarction[7,8,9].

In India, due to rapid changes in life style, ACS is presenting in epidemic proportions[9]. The patient profile is also rapidly evolving with many young patients, patients from rural areas and female patients, which was rarer earlier. New studies in Indian patients are essential for determining the ways to assist the clinicians in making an accurate diagnosis on the basis of laboratory markers that are readily available. This study is an attempt to understand the role of coagulation studies in patients of Acute Coronary Syndrome.

MATERIAL AND METHODS

This was a prospective single center study with 208 cases in which we studied the

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coagulation parameters in patients admitted in JLN Medical College Ajmer and group of Hospitals with Acute Coronary Syndrome.

We collected their blood sample prior to the initiation of any treatment and analysed it for PT, APTT, Fibrinogen levels in citrated vials, and EDTA vaccutainers for PBF and automatic hematology analyser. Detailed history was sought and final diagnosis was reached based on ECG, serial CK-MB/ troponin T measurements and echocardiography as per universal definition of myocardial infarction.[1,9] These were correlated with the coagulation abnormalities and Statistical analysis was done by using SPSS 20 software. Comparisons of categorical variables were made using the chi-square test and Fisher exact test, as indicated. Data were analyzed using the 2-tailed test to identify differences between groups and analysis of variance for repeated measures with Bonferroni correction for intragroup data. Nominal data were analyzed by the chi-square test.We considered 95% confidence intervals (CIs) that excluded unity, or, equivalently, p 0.05, as statistically significant.

Univariate analysis was done to find statistically significant tests, which were then analyzed using multivariate logistic regression. Odds ratios (OR) were calculated for the association between each test and STEMI .

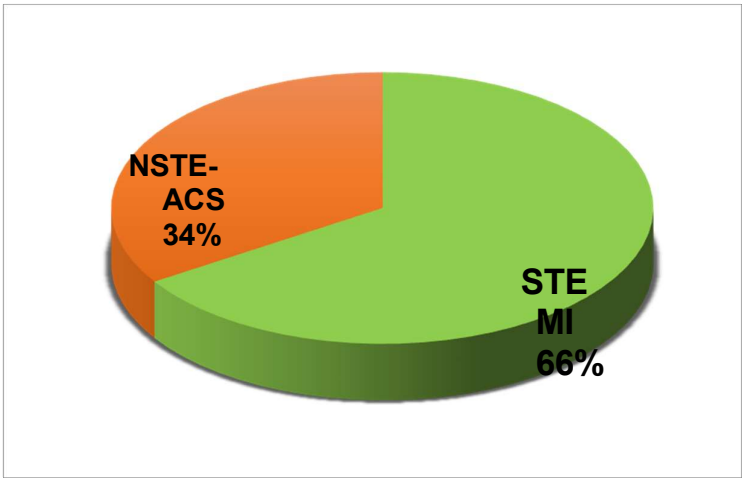
RESULTS AND OBSERVATIONS

Of 245 patients admitted, 208 patients satisfied the inclusion criteria and were enrolled in the study. Among 208 study patients, 137 (65.87%) had STEMI and 71 (34.13%) had NSTE-ACS.

Table 1.

Total No. cases	STEMI	NSTE-ACS
208	137 (66%)	71 (34%)

Figure -: 1



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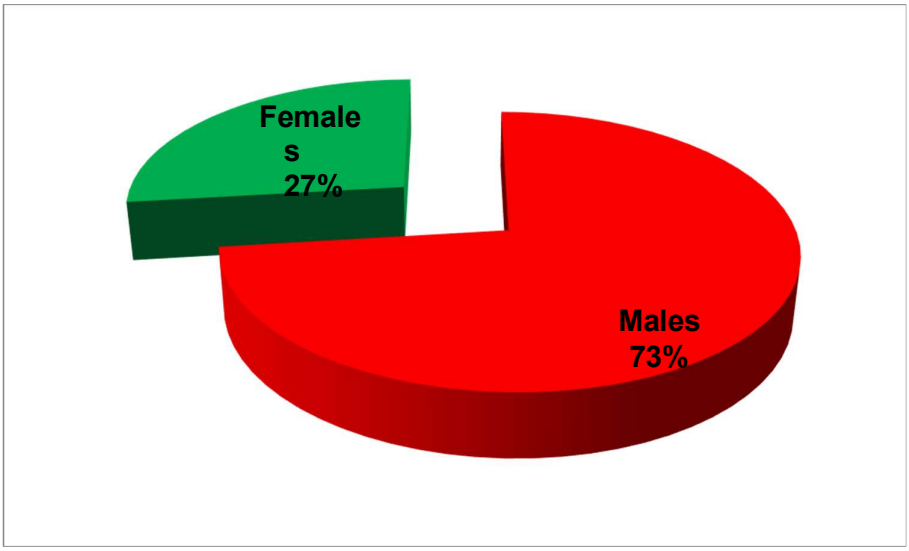
In our cohort, maximum number of patients were in age group of 41-50 years (31.73%).

Table 2

Age	Number of cases
31-40	10
41-50	66
51-60	55
61-70	52
71-80	22
81-90	2
91-100	1

Out of all, 152 (73.18%) patients were male while 56 (26.92%) were female.

Figure :2- Sex Ratio



BASELINE CHARECTERISTICS

64 patients (30.77%) had diabetes, 74 patients (35.48%) had hypertension, 43 patients (20.67%) had dyslipidemia and 58 patients (25.48%) were smokers.

Table :3-

Baseline characteristics	No. of cases
Diabetic	64
Hypertensive	74
Dyslipidemia	53
Smokers	43

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In the coagulation profile, PT was abnormal in 39 patients (18.75%), PTT was abnormal in 115 patients (55.29%) and fibrinogen was abnormal in 170 patients (81.73%).

Table :4- Coagulation abnormalities

Abnormal coagulation test	No. of cases
PT	39
APTT	115
Fibrinogen	170

PT values did not differ significantly among diabetics and non diabetics (12.72 ±2.10 sec vs 12.51±1.92 sec, P=0.480), hypertensives and non hypertensives (12.73 ±1.87 sec vs 12.49 ±2.02 sec, P=0.402), dyslipidemics and non dyslipidemics (12.33 ± 1.96 sec vs12.64 ±1.98 sec, P=0.361), STEMI and NSTE-ACS (12.67 ± 2.13 sec vs 12.38 ± 1.62 sec, P= 0.316). However, it was significantly higher among smokers than non smokers (13.28 ± 1.58 sec vs 12.3 ± 2.05 sec, P= 0.00).

PTT values did not differ significantly among diabetics and non diabetics (41.80 ± 5.76 sec vs 42.5 ± 5.45 sec, P=0.402), hypertensives and non hypertensives (41.86 ± 5.41 sec vs 42.51 ± 5.54 sec, P=0.415), dyslipidemics and non dyslipidemics (41.58 ± 4.92 sec vs 42.47 ±5.63 sec, P=0.345), smokers and non smokers (42.62 ± 4.26 sec vs 42.15 ± 5.92 sec, P= 0.582), STEMI and NSTE-ACS (42.05 ± 5.62 sec vs 42.73 ± 5.23 sec, P= 0.398).

Fibrinogen values did not differ significantly among diabetics and non diabetics (318.00 ± 139.13 mg/dl vs 278.9 ± 115.13 mg/dl, P=0.086), hypertensives and non hypertensives (286.68 ± 134.99 mg/dl vs 293.28 ± 117.97 mg/dl, P=0.714), dyslipidemics and non dyslipidemics (302.55 ± 131.55 mg/dl vs 286.44 ± 121.13 mg/dl, P=0.666), smokers and non smokers (302.55 ± 131.55 mg/dl vs 286.44 ± 121.13 mg/dl, P= 0.40). However, it was significantly higher among STEMI than NSTE-ACS (331.41 ± 117.13 mg/dl vs 212.83 ± 97.09 mg/dl, P= 0.00).

On univariate logistic regression analysis, abnormal PT (OR=1.93, 95%CI= 0.86- 4.33, P= 0.110) and PTT (OR= 1.067, 95%CI= 0.599- 1.9, P=0.827) did not have significant association with STEMI but abnormal fibrinogen levels were significantly associated with STEMI (OR=7.04, 95%CI= 3.22- 15.38, P= 0.000). Subsequently, on multivariate regression analysis also only abnormal fibrinogen levels were found to be significantly associated with STEMI (P=0.000).

Table: 5-

Total No. cases	STEMI	NSTE-ACS
208	137 (66%)	71 (34%)

NSTE-ACS,34%

PT was abnormal in 39 patients, PTT was abnormal in 115 patients and fibrinogen was abnormal in 170 patients. PT values did not differ significantly in, STEMI and NSTE-ACS (12.67 ± 2.13 vs 12.38 ± 1.62, P= 0.316 .APTT values did not differ

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significantly among STEMI and NSTE-ACS (42.05 ± 5.62 vs 42.73 ± 5.23, P= 0.398).

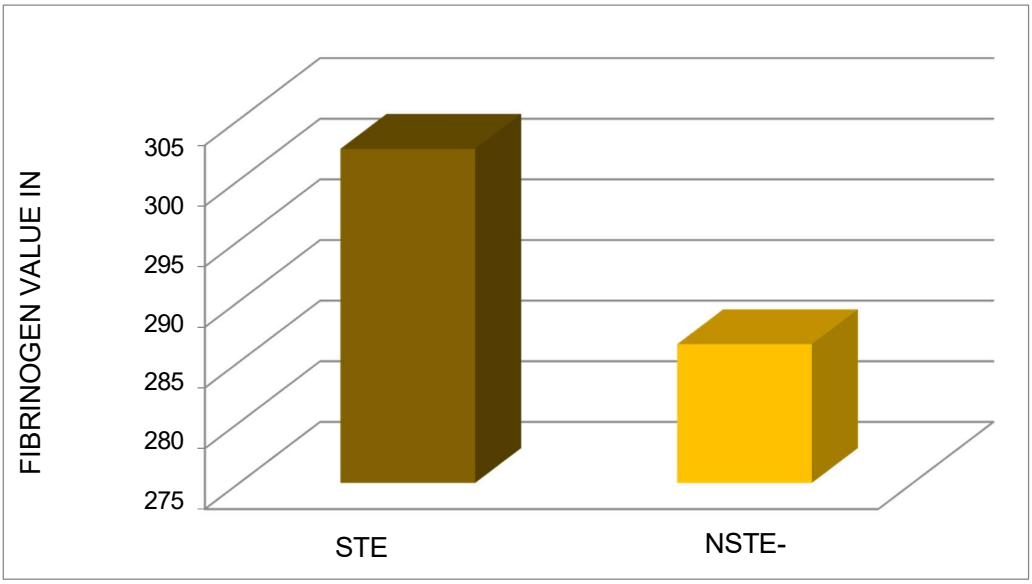
Fibrinogen values were significantly higher among STEMI than NSTE-ACS (331.41 ± 117.13 vs 212.83 ± 97.09, P= 0.00).

Table : 6
FIBRINOGEN VALUES IN STEMI AND NSTE-ACS

	STEMI	NSTE-ACS
FIBRINOGEN	331.41 ± 117.13	212.83 ± 97.09

P= 0.00

Figure -: 3
FIBRINOGEN VALUES IN STEMI AND NSTE-ACS



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DISCUSSION

The present study discusses the role of the coagulation system as a whole and its parts in the aetiology of Acute Coronary Syndrome. The underlying question is whether coagulation abnormalities have any effect on the occurrence of myocardial infarction. Sought to determine the role of coagulation parameters in patients of ACS , as well as the actual incidence and trends in hospital admissions which are diagnosed as ACS.

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Our study and multiple studies indicate that high fibrinogen levels are associated with increased risks of CHD. Omran et al[11] conducted a study that came up with the finding that serum fibrinogen levels are a significant association of Acute Coronary Syndrome. Although part of the association for fibrinogen may indeed reflect the underlying effect of chronic inflammation, causal contributions are also likely. A consistently raised Serum Fibrinogen level may indicate association with Myocardial Infarction, Similar association was observed by Wang Yunyun et al [12]in a study published in 2014

CONCLUSION

In the present study we can conclude that the majority of patients admitted with ACS are men and belong to 40-60 years of age. STEMI being a more common presentation than NSTE-ACS. Prothrombin time and APTT don't bear a significant association with the diagnosis of myocardial infarction or unstable angina but Fibrinogen levels are significantly higher in STEMI as compared to NSTE-ACS. While this may assist in suggesting a diagnosis in a clinical setting further study is mandated if we are to recommend coagulation screening tests as diagnostic tools in the diagnosis of ACS.

BIBLIOGRAPHY

1. Braunwald E, Antman EM, Beasley JW, Califf RM, Cheitlin MD, Hochman JS, et al. ACC/AHA guidelines for the management of patients with unstable angina and non-ST-segment elevation myocardial infarction: a report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines (Committee on the Management of Patients With Unstable Angina). J Am Coll Cardiol 2000;36:970–1062.
2. Lee TH, Rouan GW, Weisberg MC, Brand DA, Cook EF, Acampora D, et al. Sensitivity of routine clinical criteria for diagnosing myocardial infarction within 24 hours of hospitalization. Ann Intern Med 1987;106:181–6.
3. Gibler WB, Young GP, Hedges JR, Lewis LM, Smith MS, Carleton SC, et al. Acute myocardial infarction in chest pain patients with nondiagnostic ECGs: serial CK-MB sampling in the emergency department. The Emergency Medicine Cardiac Research Group. Ann Emerg Med 1992;21:504–12.
4. Lip GY, Blann AD. Thrombogenesis and fibrinolysis in acute coronary syndromes: important facets of a prothrombotic or hypercoagulable state? J Am Coll Cardiol 2000;36:2044–6.
5. Eisenberg PR. Novel antithrombotic strategies for the treatment of coronary artery thrombosis: a critical appraisal. J Thromb Thrombolysis 1995;1:237–49.
6. Mohan, V, Deepa, R, Rani, SS, and Premalatha, G. Prevalence of coronary artery disease and its relationship to lipids in a selected population in South India: The Chennai Urban Population Study (CUPS No. 5). J Am Coll Cardiol. 2001; 38: 682–687
7. Rogers, WJ, Canto, JG, Barron, HV, Boscarino, JA, Shoultz, DA, and Every, NR. Treatment and outcome of myocardial infarction in hospitals with and without invasive capability. Investigators in the National Registry of Myocardial Infarction. J Am Coll Cardiol. 2000; 35: 371–379
8. Rogers, WJ, Canto, JG, Lambrew, CT et al. Temporal trends in the treatment of over 1.5 million patients with myocardial infarction in the US from 1990 through 1999: the National Registry of Myocardial Infarction 1, 2 and 3. J Am Coll Cardiol. 2000; 36: 2056–2063
9. Yusuf, S, Flather, M, Pogue, J et al. Variations between countries in invasive cardiac procedures and outcomes in patients with suspected unstable angina or myocardial

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infarction without initial ST elevation. OASIS (Organisation to Assess Strategies for Ischaemic Syndromes) Registry Investigators. Lancet. 1998; 352: 507–514

10. Steg, PG, Goldberg, RJ, Gore, JM et al. Baseline characteristics, management practices, and in-hospital outcomes of patients hospitalized with acute coronary syndromes in the Global Registry of Acute Coronary Events (GRACE). Am J Cardiol. 2002; 90: 358–363
11. Mohammad T. Omran , S. Asadollahi . The measurement of Serum Fibrinogen Levels in patients with acute coronary syndrome.Saudi Med J .2007 Vol 28(9):1350-1352.
12. Wang yunyun . Smith CJ, Fischer TH. Particulate and vapor phase constituents of cigarette mainstream smoke and risk of myocardial infarction. Atherosclerosis. 2003;158:257–67.