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ACUTE ANTERIOR MYOCARDIAL INFARCTION;
THE INCIDENCE OF LEFT VENTRICULAR THROMBUS

PROF. ABDUL HAFEEZ CHAUDHRY, MBBS, FCPS (MED), FCPS(CARD),
Professor of Medicine,
Punjab Medical College, Faisalabad.

DR. KHALID AMIN, MBBS, FCPS
Assistant Professor of Medicine,
Punjab Medical College, Faisalabad.

DR. AAMIR SHAOUKAT, MBBS, FCPS
Senior Registrar,
Allied Hospital, Faisalabad.

Dr. Hanif Nagra, MBBS, FCPS
Senior Registrar,
Allied Hospital, Faisalabad.

Dr. Israr Kafeel, MBBS
Registrar,
Allied Hospital, Faisalabad.

Correspondence:
Dr. Abdul Hafeez Chaudhry
Professor of Medicine
Punjab Medical College, Faisalabad.

ABSTRACT ... drhafeezch@hotmail.com **Objectives:** The study was designed to see the incidence of left ventricular thrombus in first episode of acute MI. **Material & Methods:** This study was carried in patients admitted in Coronary Care Unit of Allied Hospital Faisalabad. Total No of patients were 30 and patients included in the study were who have first Q wave acute MI and ECG changes of ST elevation of > Imm in two contiguous lead. This diagnosis of left ventricular thrombus was made by echocardiography which was done 6 days after the admission. **Results:** A total of 30 patients with first episode of acute anterior wall MI were studied, 24(70%) were males and 6(30%) were females. The mean age of males was 51.79±13.86 and that of females was 54.83±10.15 years. On echocardiography, 8 patients had LVT, 6(75%) were males and 2(25%) were females. On admission 16(53.33%) patients were thrombolised with streptokinase. Two of them developed LVT. While others did not. Among LVT remaining 14(42.70%) patients, 6 were found to have LVT on the 6th day of admission. **Conclusion:** The study has revealed that the incidence of LVT after acute anterior MI in one population in quite significant. The increasing use of thrombolytic therapy in our setting may have favourable outcome. Patients older than 50 years of age may be at increased risk of post infarct LVT.
Keywords: Thrombus, Myocardial Infarction

INTRODUCTION

Although there has been a dramatic decrease in age adjusted death rates due to Ischemic Heart Disease (IHD) and Myocardial Infarction (MI) since 1950, it still remains responsible for most years of life lost before age 65, regardless of gender or race[1]. This decrease in mortality probably reflects advances in management of risk factors and aggressive treatment modalities of thrombolysis and active interventional techniques. The occurrence of Left Ventricular Thrombus (LVT) after Acute Myocardial Infarction (AMI) carries a significant prognostic implication. LVT occurs early after AMI even when thrombolysis

has been done[2,3]. It is universally located in the Left Ventricle (LV), particularly at the apex, but can also occur along the septum.

A mural thrombus adheres to the endocardium overlying the infracted myocardium and superficial portions of it can become detatched and produce fatal systemic arterial emboli[4]. LVT occurs much more frequently in anterior infarcts as compared to infarcts of other areas of myocardium, and in larger infarcts as compared to smaller ones[5].

The gravity of clinical implications of mural thrombi was highlighted by Mendel et al in 1998 wgi found LVT as a source of cerebral embolism in 6% of patients with cerebral infarcts[6].

LVT occurs early after AMI. The factors associated with LVT formation are:

1. Large Q wave anterior MI[7]
2. Sighs of congestive cardiac failure[7]
3. Klipp Class > 1[8]
4. Development of mitral regurgitation after AMI[9]
5. Increased and-systolic volume

Ejection fraction was found to have no relation with LVT formation[4]. Two dimensional (2 D) echocardiography has become the investigation of choice for detection of LVT, and is a useful clinical tool in identification of patients who would benefit more from aggressive management[10]. The search for mural thrombi is routinely done by 2 D echocardiography during the hospital stay.

The purpose of the present study is to make a strategy for screening of patients for LVT after Amio in our hospital setting.

AIMS & OBJECTIVES

1. To study the incidence of left ventricular thrombus in first episode of acute myocardial infarction in patients presenring to Allied Hospital, Faisalabad.
2. To develop guide lines for screening of patients with acute ami for left ventricular thrombus after MI.

MATERIAL & METHODS

Inclusion Criteria:

1. Patients with first Q wave acute AMI.
2. ECG evidence of ST elevation of > 1 mm in two contiguous leads.

Exclusion Criteria:

1. Patients with previous history of MI.
2. Patients with rheumatic heart disease and dilated cardiomyopathy.
3. Patients with prior history of mural thrombus.
4. Patients with history of systemic embolism.
5. Patients with end-stage or chronic debilitating disease.

METHODS

This study was conducted on 30 patients presenting with first episode of Q wave AMI with ST segment elevation of 1 mm in at least two contiguous chest leads. A 12 lead ECG was done for the biochemical confirmation of MI. The diagnosis of LVT was made by echocardiography which was done 6 days after the admission.

Echocardiographic Criteria For LVT (11)

1. Echodense mass with defined margins.
2. Adjacent to asynergic myocardium.
3. Identifiable throughout the cardiac cycle.
4. Distinguishable from chordal structures, muscle trabaculations or false masses.
5. Doubtful cases considered negative to minimize false positive diagnosis.

Student's T Test:

The significance of the difference between the two means was calculated by applying the t Test. Thereafter, a table for the value of t was consulted. If the calculated value of t was greater than that of t in the table for chi-square. If the calculated value was

greater than the value of chi-square in the table against the desired degree of freedom at the given level of significance, the difference was said to be significant at that level of significance.

RESULTS

A total of 30 patients with first episode of acute AMI were studied; 24 (70%) were males and 6 (30%) were females. The mean age of males was 51.79 +/- 13.86 and that of females was 54.83 +/- 10.15 years.

One echocardiography, 8 patients had LVT; 6 (75%) were males and 2 (25%) were females. On admission, 16(53.33%) patients were thromblised with intravenous streptokinase infusion; two of them developed LVT while others did not. Among the 14 (42.7%) patients who were not thrombolysed, 6 were found to have LVT on the 6th day of admission (Table 1). Out of these 30 patients, 17(56.6%) were > 50 years of age and 7 (41.17%) were found to have LVT. Among the 13 patients who were < 50 years, only 1 (7.69%) patients developed LVT (Table-II).

Table-I. Comparison of occurrence of LVT in patients with respect to treatment with thrombolytics

Thrombolytic therapy	LVT present	LVT absent	Total
Streptokinase given	2	14	16
Streptokinase not given	6	8	14
Total	8	22	30
P value is insignificant			

The prevalence of risk factors for IHD among these patients was: diabetes mellitus= 2, hypertension=12, smoking=19, family history of IHD=6, and perior history of angina=9. The mean of risk factors for IHD in patients who were found to have LVT was 2 +/- 1.414, and in patients who were not found to have LVT was 1.45+/- 0.596(t8). In the study group of these 30 patients, 11(36.66) were in cardiac failure and 6(54.5%) developed LVT, whereas 19(63.33%) patients were not in cardiac failure and 2(10.5%) developed LVT (Table-III).

Table-II. Comparison of age of patients with and without LVT.

Age-years	LVT present	LVT absent	Total
<50	1	12	13
>50	7	10	17
Total	8	22	30
0.1<P> 0.05 (Near Significance)			

Table-III. Comparison of incidence of LVT in patients with and without cardiac failure.

Failure status	LVT present	LVT absent	Total
Killip class>1	6	5	11
Killip class1	2	17	19
Total	8	22	30
P=<0.05 (Statistically significant)			

Table-IV. Comparison of incidence of LVT in hypertensives and non-hypertensives.

Hypertension Status	LVT present	LVT absent	Total
Hypertensives	5	7	12
Non-hypertensives	3	15	18
Total	8	22	30
P value is insignificant			

5(40.16%) out of 12 patients with history of hypertension developed LVT and 3(16.66%) out of 18 patients without hypertension developed LVT (Table IV). LVT developed in 4(21.05%) out of 19 patients who were smokers as compared to 4(36.36%) out of 11 who were non-smokers (Table V). (33.33%) out of 9 patients with history of angina

developed LVT when compared to 5(23.8%) out of 21 patients without history of angina (Table-VI).

Table-V. Comparison of smokers and non-smokers with respect to incidence of LVT.

Smoking Status	LVT present	LVT absent	Total
Smokers	4	15	19
Non-smokers	4	7	11
Total	4	22	30
P value is insignificant			

Table-VI. Comparison of incidence of LVT in patients with respect to presence of angina.

Angina Status	LVT present	LVT absent	Total
History of angina	3	6	9
No history of angina	5	16	21
Total	8	22	30
P value in insignificant			

DISCUSSION

Among the sequel of Acute Myocardial Infarction (AMI), Left Ventricular Thrombus (LVT) carries a grave prognostic significance. It occur early after AMI[2,3], predominantly after large anterior AMI and very rarely after inferior AMI[4]. The current study was undertaken to find the incidence of LVT in patients in our hospital setting. Thirty patients with first episode of Q wave anterior all MI echocardiographically examined on the sixth day after MI for the presence of LVT. LVT was found in 26.66% patients [n=8]. It was found that there was a 70.79% reduction in relative risk of LVT after treatment with thrombolytic therapy [streptokinase] [Table-I]. Although it seemed to be a significant reduction in relative risk for LVT after thrombolytic therapy it was found to be statistically not significant (Table-I).

Some international studies [domeicucci et al and Bhatnagar et al][11,12] have documented a statistically significant decrease in the incidence of LVT after thrombolytic therapy. Our study sample was small and comprised of only thirty patients, if we had a large patients sample our statistical evaluation might have revealed a similar decrease in the incidence of LVT after thrombosis. This study also revealed that gender was not a predisposing factor for the occurrence of LVT.

It was found that the difference between the mean age of patients who developed LVT and those who did not was not significant; but the increased occurrence of LVT in patients older than 50 years of age was statistically close to significance (Table-II). We also found that the risk factors for IHD are not risk factors for development of LVT (Table-IV, V, VI). However in our study, formation of LVT was found to be associated with the development of signs of congestive heart failure. In a study by Mooe et al, the incidence of LVT in patients admitted with anterior Ami was observed to be 46% in those who received thrombolytic therapy [streptokinase] and 40% in those who no thrombolytic therapy[13]. These results are higher than the results observed in our study [26.66%]. The difference between our study and the one being compared of that Mooe et al carried out two echocardiograms on their patients during the hospital stay [at three days post-MI and predischarge] in contrast to our study where we did only one echocardiogram on the sixth day after MI. The second important difference is that Mooe et al included patients with previous MIs in their study, and found that previous MI was strongly associated with the occurrence of LVT, whereas in our study we selected patients only wiht first MI. These differences could have resulted in the increased occurrence of LVT observed in the study by Mooe et al.

Another significant study related to LVT after AMI is The healing and Early Afterload Reducing therapy [HEART] study. Ann ancillary of this study appeared in the American journal of cardiology in 1997 by Greaves et al[14]. The incidence of LVT after AMI in their study was 0.6% at day one, 3.7% at day 14, and

2.5% at day 90. In their study, all patients with acute MI were included irrespective of the site of infarct and they did not restrict to patients with anterior wall MI only, as we have done in our study. Patients with previous Mis were also included in their study [16.2%], in contrast to our study where we have include only patients with first MI.

This could account for the lower incidence of LVT in their study, as the occurrence of LVT in jnfarcts other than anterior is very rare[15]. Only 20.77% patients in the study by Greaves et al developed cardiac failure [killip class>1], whereas 57.89% patients in our study developed cardiac failure. As already emphasized, signs of congestive cardiac failure are associated with the formation of LVT[8], this could also be one of the reasons for higher incidence of LVT in our study. Greaves et al found LVT most frequently on day 14 after MI, whereas we performed echocardiography in our patients on the 6th day after MI.

CONCLUSION

Our study has revealed that the incidence of LVT after acute anterior myocardial infarction in our population is quite significant. The increasing use of thrombolytic therapy in our hospital setting may have favourable outcome vis-a-vis post-infarct LVT. It needs to be emphasized that in patients with post-infarct cardiac failure the incidence of LVT is increased. Patients who are older than 50 years of age may also be at increased risk of post-infarct LVT.

Echocardiography is a reliable method for the screening of patients for LVT and should routinely be carried out in patients with anterior AMI before discharge form hospital, especially if they are in cardiac failure and if possible on follow up visits as well.

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