

# ISCHEMIC STROKE IN PATIENTS WITH ST ELEVATION MYOCARDIAL INFARCTION AND ITS RELATION TO LEFT VENTRICULAR THROMBUS

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## ABSTRACT

**Objective:** To determine the frequency of stroke in patients with ST elevation Myocardial infarction and its association to LV thrombus.

**Methodology:** This descriptive cross sectional study was carried out in department of Cardiology of Hayatabad Medical complex, Peshawar. Total 119 patients were included. Patients were assessed for the presence or absence of Left ventricular thrombus & its association with stroke.

**Results:** Out of 119 patients, there were 36(30.2%) female patients and 83(69.7%) male patients. The mean age of presentation was 59.5±11.0 years. Out of total 119 patients, 06 had thrombi in the Left ventricle and 03 had stroke. Four out of 6 patients with Left ventricular thrombus had Anterior wall Myocardial infarction.

**Conclusion:** Left ventricular thrombus formation is associated with anterior wall myocardial infarction & stroke.

**Key Words:** Myocardial infarction, Stroke, LV Thrombus

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## INTRODUCTION

Stroke is a less frequent but disabling condition that is not commonly associated with ST elevation myocardial infarction. Embolic phenomenon as a result of atherosclerosis & atrial fibrillation usually results in stroke associated with myocardial infarction<sup>1-4</sup>. Patients with STEMI are reported to have increased incidence of stroke during hospitalization as compared to patients with NSTEMI or unstable angina<sup>5</sup>. The recognition of stroke predictors in patients with an ST elevation myocardial infarction will result in early prevention through prompt recognition & revascularization in patients. Such a goal can be achieved in identifying at risk individuals & treating them aggressively & early. Also to avoid such therapies in at risk individuals that are contraindicated in cases of ischemic stroke e.g. prasugrel.

## METHODOLOGY

Our study was conducted in Coronary Care Unit, Post Graduate Medical Institute, Hayatabad Medical Complex, Peshawar.

This was a descriptive cross sectional study. A total of 119 patients were enrolled in the study by consecutive sampling method. A detailed history of acute illness, family history of coronary artery disease, hypertension, diabetes mellitus and early deaths due to CAD was

taken. Patient of all ages and of both sexes were studied. Patients with chest pain typically lasting for more than 30 minutes and with characteristic ECG changes of acute STEMI were included. Acute myocardial infarction was also considered in patients with a positive Troponin T test and increase in CK-MB levels. Patients without typical chest pain and without significant ST-T wave changes were not recruited in the study.

A detailed 2D and Doppler echo study was done in all technically feasible patients on admission, 3<sup>rd</sup> and 5<sup>th</sup> day before discharge. Aloka SSD 870 color Doppler and 2-D echo system was used for echocardiographic examination. In order to get optimum 2D and Doppler information, both continuous wave (CW) and pulsed wave (PW) Doppler modalities were acquired using 3.5 MHz and 5 MHz phased array transducers.

Approval of ethical committee and informed written consent of the patient admitted through OPD and emergency with acute ST segment elevation MI was taken. Focused history and relevant examination was carried out. ECG was recorded and their blood sample was collected for CK-MB and Trop-T level and patients was diagnosed as acute MI when the operational definition is fulfilled. Echocardiography was performed at bedside on first, 5<sup>th</sup> and 7<sup>th</sup> day to look for LV thrombus. Type of therapy for treatment of acute MI was mentioned and preformed proforma was used for collection of data. All

these observations and measurements was performed by authors and strictly inclusion and exclusion criteria was followed so that to avoid any bias in data.

## RESULTS

We studied a total of 119 consecutive patients. 83 patients were male constituting (69.7%) of all of our patients and 36 were female (30.3%) as shown in Table 1.

The patient population can be divided into different age groups i.e. 31-40 years, 41-50 years, 51-60 years, 61-70years, 71-80 and more 81-90 years age groups as shown in (Table 2).

Out of 119 patients, 6 patients showed clinical evidence of systemic arterial embolization (5%). Out of these 6 patients, all of them had central nervous system embolism where as no patient had peripheral embolism. Three out of the six patients did not receive streptokinase on the account that they were late for the streptokinase injection.

All these patients had no clinical evidence of systemic embolization at admission nor they had any history of cerebrovascular accident or limb arterial embolism in past. Three patients from left ventricular thrombus positive group showed evidence of stroke (Table 3)

## DISCUSSION

In our study 06 out of 119 patients had stroke out of which only 3 had left ventricular thrombus. In a study by Nicholas et al LV thrombus occurred in 8.7% of patients with anterior STEMI and EF <40%<sup>6</sup>. In patients with MI, majority of ventricular clot formation occurs when there is hypo or akinesia of anterior wall. Thrombi are frequently found during the first 10 days of a coronary event, although patients may be prone to thrombus formation during the initial 1 to 3 months<sup>7</sup>.

The size of infarct is considered proportionately related to the risk of thrombi formation. Antero-apical infarction is related to elevated incidence of LV thrombus, exceeding 50% during the early post MI period. There is a greater rise of serum creatine kinase concentrations to more than 2,000 units/liter<sup>8,9</sup>.

In the GISSI-3 database, EF ≤40 percent, was associated with an increase in the incidence of LV thrombus with both anterior MI (17.8 versus 9.6 percent with a higher LVEF<sup>9</sup>) and infarctions at other sites (5.4 versus 1.8 percent). So ability of heart to maintain adequate contractility is also a contributor. This was also inferred in our study which clearly demonstrated relation of extent of infarct to thrombus formation with anterior MI most common followed by anterolateral MI associated

**Table 1: Gender distribution (n=119)**

Gender	Frequency	Percentages
Male	36	30.3
Female	83	69.7
Total	119	100

**Table 2: Age distribution (n=119)**

Age groups (years)	Number of patients	Percentages
31-40	06	5.04
41-50	27	22.68
51-60	43	36.13
61-70	29	24.36
71-80	11	9.2
81-90	03	2.52

**Table 3: Presence of left ventricular thrombus and its relation to stroke**

LVT	CVA		Total
	No	Yes	
No	107	3	110
Yes, on day 1	3	3	6
Yes, on day 5	3	0	3
Total	113	6	119

**Table 4: Left ventricular thrombus and type of myocardial infarction**

MI	LVT		Yes, on day 5	Total
	No	Yes, on day 1		
Anterior	60	4	2	66
Antero-inferior	3	1	0	4
Antero-lateral	6	1	1	8
inferior	41	0	0	41
Total	110	6	3	119

with LV thrombus formation (Table 4). Studies conducted by Chesebro & Meltzer also point toward association of Left ventricular thrombus with anterior myocardial infarction, as in our study<sup>7,8</sup>.

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## CONTRIBUTORS

A conceived the idea, planned the study, and drafted the manuscript. JK helped acquisition of data and did statistical analysis. MAI drafted the manuscript and critically revised the manuscript. All authors contributed significantly to the submitted manuscript.