

INCIDENCE OF LEFT VENTRICULAR THROMBUS (LVT) IN ACUTE MYOCARDIAL INFARCTION (AMI)

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SUMMARY

A 2-D echocardiographic and clinical prospective study in 235 consecutive, technically suitable patients of AMI was done. LVT was found in 12.7% of all AMI patients with 17.6% incidence among anterior and 4.4% incidence in inferior infarction patients. The LVT was found to be more commonly associated with anterior infarcts, LV dysfunction, mitral regurgitation, and diabetes mellitus. 2.9% of all patients showed evidence of systemic embolism. Though anticoagulant and thrombolytic agents did not reduce the incidence of LVT formation and systemic embolism the later significantly preserved LV function and reduced the complication rate of AMI such as, mitral regurgitation, LVT, cardiogenic shock and cardiac dilatation.

INTRODUCTION

A left ventricular thrombus formation usually occurs in AMI with its potential to embolize.^{1,2,3} It is commonly associated with anterior infarcts, LV dilatation, poor LV function. A 2-D echo examination before discharge can recognize with great accuracy these complications and we can identify low and high risk patients before discharge and modify the treatment of high risk patients in a favourable way.

MATERIAL AND METHODS

235 patients of both sexes with anterior, inferior and non Q wave infarction were recruited in study. The age ranged from 20 years to 70 years mean age being 53.3 years.

All alive patients were studied before discharge. The diagnosis of AMI was confirmed by typical chest pain lasting more than 30 minutes with Q wave of 0.04 sec duration and ST elevation of at least 1 mm in two consecutive precordial or limb leads, with raised cardiac enzymes. 96 patients

group I (or SK group) received streptokinase as thrombolytic agent whereas 139 patients group II did not receive streptokinase. Streptokinase was followed by intravenous heparin. 150 mg of aspirin was given to all patients.

RESULTS

153 (65.10%) patients had anterior infarcts, 67 (28.5%) patients inferior and 15 (6.3%) patients belonged to non Q wave category.

In 235 patients LVT rate was 12.76%. Among anterior infarcts LVT rate was 17.6% and 4.4% in inferior infarcts. None of non Q wave MI showed LVT.

A total of 7 patients (2.9%) showed thrombo embolism which was highest among LVT positive patient 10% compared to 1.95% embolism rate in non LVT cases ($P < 0.01$).

Patients with $EF < 35\%$ had LVT incidence of 20% VS 7.8% rate in patients with $EF > 55\%$ ($P < 0.05$).

LVT rate with dilated hearts on X-ray was 30.1% VS 11.6% in normal hearts ($P < 0.025$).

LVT rate was 22.7% in LVF patients compared to 11.79% in non LVF cases ($P < 0.01$). Those patients with dilated hearts on 2-D echo had LVT rate of 19.29% compared to 16.67% rate in normal heart size on echo ($P < 0.01$).

In patients with Doppler detected MR, LVT was 23.4% compared to 10.1% LVT occurrence in non MR patients ($P < 0.05$). The incidence of diabetes was 30% among LVT cases ($P < 0.001$). The rate of LVT formation was 13.54% and 12.23% among SK and non SK groups respectively.

In SK group better LV function was seen. In SK group 50% of patients had EF $> 55\%$. In non SK group only 42% had EF $> 55\%$. Similarly patients with poor LV function (EF $< 35\%$) were more commonly seen in non SK group (14%) versus only 5% of such patients in SK group ($P < 0.25$).

DISCUSSION

Our study was a 2-D echocardiographic study. We evaluated the rate of LVT formation in all types of AMI patients and associated clinical conditions, such as LVF, thrombo embolism, and effects of adjuvant therapy. Many workers have found 2-D echo as useful non-invasive technique for evaluation of above mentioned clinical conditions and risk stratification of AMI patients before discharge.^{4,5,6} Similar information was obtained by us in term of low and high risk patients. The former being those cases without evidence of LVT formation, lesser degree of LV dysfunction and hemodynamic complications. LVT positive patients were noted to have lower ejection fractions, high wall motion scores and high rates of MR. This observation in our study is well supported by the work of Bhatnagar S K et al.³ In his series also the patients with LVT had higher mean wall

motion score index, higher MR incidence and lower ejection fractions as compared to those without LVT formation.

We have observed that most of LVT occurred on anterior infarcts. The anterior infarcts provide more favourable circumstances for LVT formation in form of larger infarcted areas, more common formation of aneurysms, and dyskinetic segments.^{8,9} This observation is supported by studies done elsewhere in particularly that of Montro M et al.⁷ The rate of LVT formation varies from 10 to 40% as is evident from review of some studies.^{1,2,3} The reason for variable occurrence rate may be type of patients selection, number of echo examinations performed, interobserver-variability and variable effects of anticoagulant and thrombolytic therapy. The study of Montro M et al⁷ shows LVT incidence of 9.2% and 2.9% among anterior and inferior infarcts.

AMI causes the loss of viable myocardium (capable of pumping blood), cardiac dilatation and damage to papillary muscles. All these mechanisms lead to reduced EF, LVT formation, high incidence of MR, and cardiogenic shock. This observation is confirmed by results of our own study including the studies of Bhatnagar S K et al,³ Roohi et al, A Shahzad et al and another study done by Bassand J A et al.^{10,2,12} The effects of thrombolytic therapy are very encouraging in the sense that it is found not only to preserve LV function but also reduce the complication rate of AMI. The thrombolytic agents are reported to improve LV function, reduce complication and decrease morbidity and mortality by reducing the infarct size, LV dilatation, thrombo-embolism and improving efficiency of stunned myocardium besides imparting electrical stability.

In our series of 235 patients the overall rate of thrombo-embolism was 2.9%. The thrombolytic and anticoagulant therapy has no significant bearing on thrombo-embolism.

We noticed diabetes mellitus as single most important risk factor predisposing to LVT formation, since diabetes mellitus predisposes to advanced arteriosclerosis and angiopathies. The risk of AMI and its complication is 2-3 times higher among diabetic patients and the same could be explanation for higher rate of LVT among diabetic patients in our study.

CONCLUSION

At the end we conclude that 12.7% of our patients had a LVT. Majority of thrombi occurred among anterior infarcts and they were associated with LV dysfunction, mitral regurgitation, LVF, cardiogenic shock and diabetes mellitus.

Anticoagulant and thrombolytic therapy did not seem to modify the LVT formation and thrombo-embolism however the later significantly preserves LV function and reduces the complication rates of AMI as such, LVF, MR, and cardiogenic shock. The thrombolytic therapy should be routinely given to all AMI patients as earlier as possible after onset of chest pain if indicated.

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