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EFFECT OF TIME ON LEFT VENTRICULAR SYSTOLIC FUNCTION IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION RECEIVING STREPTOKINASE

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ABSTRACT

Objectives: To determine the effect of time on left ventricular function in patients with Acute Myocardial Infarction recieving Streptokinase.
Methods: It was case series study conducted ay cardiology department civil hospital Karachi from 1st March 2011 to 30th November 2011. 165 patients of acute myocardial infarction admitted for the first time in cardiology department were assessed for left ventricular dysfunction through echocardiography after streptokinase administration and was co related with time from onset of symptoms and administration of symptoms.
Results: Left ventricular dysfunction on echocardiography was observed in 81(49%) cases in which 40.7% (33/81) were in severe condition, 24.7% (20/81) in moderate and 34.6% (28/81) were mild. Frequency of left ventricular dysfunction and its severity was observed with respect to duration of symptoms and severe left ventricular dysfunction was linearly increased with respect to duration of symptoms**.**
Conclusion: Frequency of Left ventricular dysfunction and its severity was linearly increased with respect to duration of symptoms. So there should be some awareness program for general public regarding awareness about symptoms of MI and early contact to medical personal.By doing this the morbidity and mortality in patients who present with acute myocardial infarction can be decreased.

Keywords: Acute myocardial infarction, Left ventricular systolic dysfunction, Echocardiography, Streptokinase.

INTRODUCTION

Acute myocardial infarction (AMI) is an important cause of acute emergencies and incidence is rising in the world.[1] Applying the conservative estimate of 30% of the ACS patients who have STEMI from the National Registry of Myocardial Infarction.[2] One third of patients who experience STEMI will die within 24 hours of the onset of ischemia, and many of the survivors will suffer significant morbidity leading to Left ventricular systolic dysfunction (LVSD) [3].LVSD is a common and serious complication of AMI that leads to greatly increase in the risks of 2-3 fold for heart failure (HF) and death.[4] Prevalence of LVSD after an AMI is about 30%-40%[2]. More than half of AMI deaths were in developing countries due to LVSD. [1] The population of South Asia represents more than a quarter of the developing world, and is likely to be strongly affected by the increase in AMI.[5] Limited information is available on trends in mortality from cardiovascular diseases in Pakistan, a large number of early deaths were due to cardiac arrhythmias and LVSD.[6] Morbidity and mortality from STEMI can be reduced significantly if patients and bystanders recognize symptoms early, activate the Emergency Medical Service (EMS) system, and thereby shorten the time to definitive treatment.[7] Time from onset of symptoms to fibrinolytic therapy is an important predictor of MI size and patient outcome.[8] Early reperfusion of ischemic myocardium within the risk

region of an occluded infarct-related artery interrupts the wave front of necrosis, reduces ultimate infarct size, preserves regional and global ventricular function, and improves survival.

PATIENTS AND METHODS

It was case series study conducted ay cardiology department civil hospital Karachi from 1st March 2011 to 30th November 2011. 165 patients of acute myocardial infarction admitted for the first time in cardiology department detailed history was obtained specially duration of symptoms, streptokinase was administered and were assessed for left ventricular dysfunction through echocardiography after administration of streptokinase.

All male and female patients of AMI (on set from time of 0-08 hrs) admitted for the first time with Age >20 years were included. Patients with known CAD, Patients with known LV dysfunction, Patients with Post CABG angina or MI, Patients with Post PCI, Patients with valvular heart disease and Patients who refuse for study were exclude

The patients were included through emergency room of Civil Hospital Karachi. Those patients who reported with AMI and qualify the inclusion and exclusion criteria their ECG was done on the arrival of patient to establish the diagnosis of AMI were included, Streptokinase was given to patients as soon as diagnosis of AMI is made; further echocardiogram was done in emergency room 90 minutes after completion of streptokinase to determine LVSD on the basis of EF . The information was entered in the Performa attached as annexure.

Data was entered and analyzed in statistical software (SPSS-12). Frequency and percentage were computed for categorical variables like gender, duration of symptoms, left ventricular dysfunction and severity if LV dysfunction. Mean, standard deviation, 95% confidence interval were computed for quantitative measurement like age. Stratification was done with regard to age, gender and duration of symptoms to see the effect on outcome.

RESULTS

A total of 165 patients with acute myocardial infarction after streptokinase were included in this study. The average age of the patients was 56.67 ± 13.14 years (95%CI: 54.65 to 58.69) . Out of 165 patients 118(72%) were male and 47(28%) were female. Duration of symptoms of 95(57.6%) cases were in 1 to 3 hours, 45(27.3%) were less than one hours similarly of 21(12.7%) patients were 4 to 6 hours and 4(2.4%) cases were above 6 hours. Minimum duration of symptoms was 20 minutes and maximum was 10 hours. Left ventricular dysfunction (LVSD) was observed in 81(49%) cases in which 40.7% (33/81) were in severe condition, 24.7% (20/81) in moderate and 34.6% (28/81) were mild. LV dysfunction was most common in 41 to 70 years of age that is 66(81.4%). Regarding severity, severe LV dysfunction was observed high in 41 to 50 years (52.6%), 51 to 60 years of age (32%), 61 to 70 years of age (45.5%) and similarly severe LV dysfunction was also high in above 70 years of age. Frequency of LV dysfunction and its severity was observed with respect to duration of symptoms are presented in table 1. Severe LV dysfunction was linearly increased with respect to duration of symptoms.

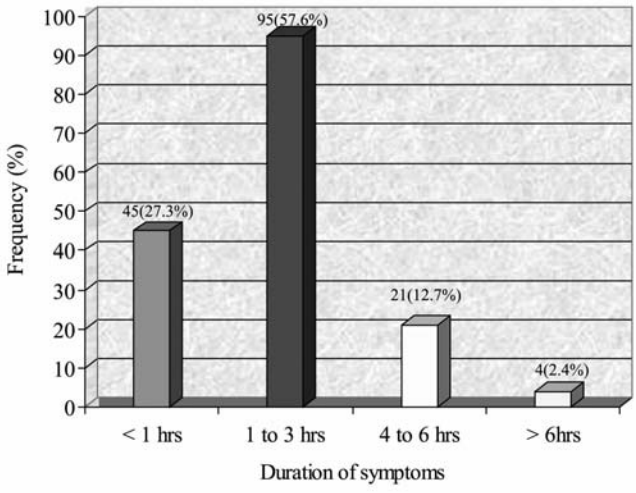
TABLE 1

SEVERITY OF LV DYSFUNCTION WITH RESPECT TO DURATION OF SYMPTOMS
n=81

Duration of Symptoms	LV Dysfunction			
	n	Mild	Moderate	Severe
< 1 hours	**7**	5(71.4%)	2(28.6%)	0(0%)
1 to 3 hours	**51**	23(45.1%)	12(23.5%)	16(31.4%)
4 to 6 hours	**19**	0(0%)	6(31.6%)	13(68.4%)
> 6 hrs	**4**	0(0%)	0(0%)	4(100%)

FIGURE 1

DURATION OF SYMPTOMS
n=165



Minimum duration = 20 minutes
Maximum duration = 10 hrs

DISCUSSION

In the present study, we examined the frequency LV dysfunction in patients with acute myocardial infarction after the streptokinase in thecoronary care unit of civil hospital karachi, Data show that streptokinase treatment reduced the extent of necrosis and improved LV function if patient arrive early in emergency room and reperfusion early with streptokinase. Indices of global ventricular function, such as ejection fraction and stroke volume, were better in the patients receiving streptokinase with in one hour of start of chest pain. Treatment with streptokinase maintained LV function better in any extent of necrosis (in both small and large infarcts) suggests that streptokinase improved function not only by reducing necrosis but also by favorably affecting the peri-infarcted viable but stunned myocardium. Thrombolytic therapy for acute myocardial infarction reduces early mortality, and also helps in recovery of left ventricular function after reperfusion.

The major effect of the introduction of streptokinase therapy on mortality after myocardial infarction has been a dramatic decrease in the number of patients dying from cardiac failure.[10] Severe

LV dysfunction was linearly increased with respect to duration of symptoms. our aim in the present study was to test the effects of treatment on anatomic infarct size expressed as a function of the ischemic risk zone and to evaluate its effects on global. Streptokinase decreased anatomic infarct size and caused an improvement in LV function after reperfusion depanding upon the duration of symptoms. This study demonstrated not only improved global LV function but also improved regional LV wall function. In the Thrombolytic era, left ventricular function has remained the most important prognostic factor after recovery from acute myocardial infarction. There are three trials with the statistical power to evaluate left ventricular function, where both left ventricular function and survival were improved compared to placebo or control treatment. The recent Global Utility of Streptokinase and Tissue Plasminogen Activator for Occluded Coronary Arteries (GUSTO) Trial supports these findings, with left ventricular function being strongly correlated with mortality reduction. Left ventricular function, measured at 90 min either as ejection fraction, end-systolic volume or infarct zone contractility, closely correlated with 30 day mortality.[11] One of the most important determinants of improvement in the ejection fraction appears to be sustained successful reperfusion.

Harrison and colleagues studied the effect of early reperfusion of infarct related artery was independently associated with improvement in the left ventricular ejection fraction.[12]

Meijer and colleagues showed an increase in the ejection fraction from 51 (10)% within 48 hours after thrombolysis to 55 (11)% after three months in 95 patients with sustained reperfusion, compared with no change in 34 patients with reocclusion of the infarct related artery. [13]

Marzoll and colleagues studied 137 patients with acute myocardial infarction and found that those with the lowest baseline ejection fraction within 24 hours of acute infarction were the most likely to improve before hospital discharge.[197] The only predictors of both regional and global systolic ventricular functional improvement were early time to treatment.[14] The Thrombolysis and Angioplasty in Myocardial Infarction (TAMI) investigators were unable to find a significant relationship between time to treatment and subsequent improvement in global or regional ventricular function in a large cohort.[15]The results of this study suggest that echocardiography is frequently not performed during the in-hospital MI period. Echocardiography after streptokinase in patients with acute myocardial infarction provides information that favorably alters management. Either may lead to early identification of patients with LV systolic dysfunction or other evidence of impairment, increasing the use of medical therapy as well as early invasive therapy with proven survival benefit or encouraging more vigilant attention to a patient's clinical status.

CONCLUSION

Frequency of Left ventricular dysfunction and its severity was linearly increased with respect to duration of symptoms. So there should be some awareness program for general public regarding awareness about symptoms of MI and early contact to medical personal.By doing this the morbidity and mortality in patients who present with acute myocardial infarction can be decreased.

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