DISCUSSION

The current study was conducted on 30 patients with acute STEMI presenting to the Critical Care Department at Cairo University Hospitals in the period between June 2011 and May 2012.

Reperfusion therapy is the cornerstone of the treatment of patients with acute ST elevation myocardial infarction (STEMI) *(3)*. That is why many trials nowadays are focusing on assessment of myocardial perfusion to assess the success of primary PCI.

The aim of reperfusion therapy for many years has focused on achieving epicardial artery patency at the site of the occlusive thrombus. It is now possible, through advances in interventional techniques and adjunctive pharmacological treatment, to achieve TIMI grade 3 epicardial flow in most of patients. Despite this achievement, mortality, although declining, still remains high . This is possibly because despite restoration of TIMI grade 3 flow, 40% of patients do not

achieve microvascular flow, which should be the goal of reperfusion therapy (5,6).

Previously, LV function parameters for prognosis after acute myocardial infarction have been mainly systolic parameters. However, in the last decade there has been increasing attention on the prognostic importance of diastolic dysfunction because patients with preserved systolic function after acute myocardial infarction, but with pulmonary congestion caused by impaired diastolic function, have a poor prognosis (123).

several investigations focused on the clinical implications of neurohormonal activation after acute myocardial infarction (MI). BNP concentration rises rapidly over the first 24 hours after MI and then tends to stabilize; patients with a large infarct may have a second peak approximately 5 days later, perhaps reflecting the remodeling process.(124) When measured 1 to 7 days after MI, BNP elevation identifies patients at risk for LV dysfunction, heart failure, and death.(125,126).

The aim of this study is to assess acute change in LVEDP in patients with acute STEMI after primary PCI as an indicator for diastolic function improvement after revascularization and comparing it with other clinical data (Chest pain & ST segment

resolution , peaking of cardiac enzymes , mortality & BNP level before and after revascularization).

Our study detected rapid improvement in diastolic function and decrease in LVEDP significantly after successful reperfusion **(p value:0.001)** with no statistically significant difference between patients with either anterior or inferior STEMI **(p value:0.51).**

- **Few studies were found to assess the acute change in LVEDP as an indicator of successful reperfusion.**

Our study was compatible with the following studies:

Engin Bozkurt et al, 2010,(127) who studied 29 patients with acute STEMI and concoluded significant decrease in LVEDP after successful reperfusion with primary PCI ($p<0.05$). with no statistically significant difference between patients with anterior or inferior STEMI ($p=0.657$). Similar results were obtained from our study.

Maurice Remmelink et al,2008,(128) who studied 15 patients with acute anterior STEMI undergoing primary PCI and concoluded that Online PV loop assessment during primary

PCI showed that coronary reperfusion caused an immediate improvement in diastolic function by increasing LV compliance and in systolic function by increasing apical contractility in STEMI patients.

Our results regarding acute change in LVEDP agreed with the results of **Amr Mostafa et al**,**2009**(129), Ain shams university master degree Thesis , who conducted 30 patients with acute anterior STEMI with significant decrease in LVEDP after Primary PCI.

- ❖ Regarding clinical outcome in our study , 24 patients had ST segment resolution(80%), 28 patients had chest pain resolution (93 %) and 26 (86%) patients their LV function were preserved.

Our clinical outcome data agreed with ***Van't Hof AW et al ,(1998)***(130),who conducted 777 patients in which ST segment resolution occurred in 81% of patients , 90% had resolution of chest pain and 93% of patients had preserved LV function.

The mortality rate of our study was 10% (3 patients), 2 patients (6.7%) inculuded in our study had recurrent MI in the same site.These results agreed with the results of ***Henriques JP et al (2003)***(131)**,**who studied 1791 patients, in which

mortality rate was 4.1% and survival was 95.9% with recurrent ischemia of 17% over 6months follow up.

- **Regarding correlation of acute LVEDP change and clinical outcome our study disagree with** :

Amr Mostafa et al,2009(129),who found significant correlation between acute LVEDP change and different clinical inhospital outcome data regarding chest pain resolution , LV systolic function ,ST segment resolution & Mortality.

Our study concoluded that acute change in LVEDP was not an independent predictor of in-hospital outcome and this may be explained by:

- Exclusion of high risk patients.
- Either systolic or diastolic indexes reflected instantaneous measurements, and could vary across the ACS period. Therefore a single measurement might not reflect the best prognostic index.
- There were no reports on the diastolic function previous to the index ACS admission, nor there was a noninvasive echocardiographic assessment of the mitral inflow.

- ❖ Few papers were found to study prognostic utility of invasively measured LVEDP in ACS :

Planer D et al,(132) concoluded statistically significant results regarding death and death or reinfarction at 30 days (p value:0.007 & 0.002 respectively) and at 2 years (p value:0.009 & 0.002 respectively) For STEMI patients with LVEDP >18 mm Hg versus those with ≤18 mm Hg in the study which included 2,797 patients .

Rogério Teixeira et al,(133) who studied LVEDP in 675 patients with ACS in 2004-2006 and concoluded that LVEDP was not an independent predictor with respect to in-hospital mortality, one-year mortality and one-year ischemic complications (MACE rate).

- ❖ Several studies had indicated that measurement of circulation of B-type natriuretic peptide (BNP) could predict the prognosis of acute coronary syndromes (ACS) **(de Lemos et al., 2001)** (134)**. (Perkiömäki et al.,2010)**(135) found that increased baseline BNP had a significant association with heart failure hospitalization after AMI. However, there are few

reports on the influence of percutaneous coronary intervention (PCI) on plasma BNP of patients with STEMI.

This study compared the BNP levels on presentation and on day 5,we detected trend of BNP level to decrease after primary PCI but this trend was not associated with statistical significance **(p:0.07).** The decrease in BNP level was not an independent predictor of in-hospital outcome .

Dilić et al. (2011),(136) studied 92 patients with STEMI , BNP was determined on admission and 18 hours later . He proved significant decrease in BNP level after primary PCI. Comparing STEMI patients who underwent primary PCI to those treated conservatively he detected much lower BNP level after 18 hour. So in compatiple with our study if the ischemia could be stopped, the BNP level could be significantly lower .

Jiang et al. (2004), (137) proved that in patients whose early circulating BNP level was greater than 80 pg/ml, the incidence of mortality and heart failure could be reduced in patients with acute coronary syndromes treated by early PCI .

Ceriani and Giovanella (2007), [138] studied the perfusion defect (infarct size) in 54 MI patients using 99mTc-sestamibi G-SPET and showed a positive correlation between BNP and the perfusion defect after MI. . No significant relationship was found between the BNP level and LVEF, EDV or ESV values calculated from at-rest G-SPET.

Darbar et al (1996). [139] found that BNP measured 3 days after STEMI was associated with cardiovascular mortality over a follow-up period of almost 2 yr.

- **Regarding clinical correlation of BNP level and in hospital clinical outcome:**

Maria Dorobantu et al[140]**.** studied 88 patients with acute STEMI **,** ROC curve analysis showed that BNP measurements on admission and at 24 hours after revascularization have no predictive value neither for diastolic LV dysfunction in anteior or inferior AMI patients, nor for systolic LV dysfunction in inferior AMI patients. Only BNP levels at 24 hours after revascularization can predict systolic LV dysfunction in anterior AMI patients with a 90.3% sensitivity and a 60% false positive rate at a cutt off value of 90pg/ml .

Seo Sm et al (2006),(141) studied 102 patients with STEMI , and conculuded that higher BNP level on admission was associated with higher incidence of incomplete ST segment resolution.

No previous studies correlated the acute change in LVEDP with BNP level change after primary PCI.

Our study conculuded that there is no statistical significant correlation between them .