

**Resolution of Reciprocal ST-segment Depression
After STEMI in Patients Treated With Intravenous
Thrombolytic Therapy: Prognostic
Significance And its Correlates**

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

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List of Abbreviations

<i>Abbr.</i>	<i>Full-term</i>
ACEI	: Angiotensin-converting enzyme inhibitor
ACS	: Acute coronary syndrome
ADA	: American Diabetes Association
ADP	: Adenosine diphosphate
AMI	: Acute Myocardial Infarction
BMS	: Bare-metal stents
BUN	: Blood urea nitrogen
CABG	: Coronary artery bypass grafting
CAD	: Coronary artery disease
CHF	: Congestive heart failure
CK	: Creatine kinase
CRISP	: Counterpulsation to Reduce Infarct Size Pre-PCI
cTn	: Cardiac troponin
CURE	: Clopidogrel in Unstable angina to prevent Recurrent Events
CVA	: Cerebrovascular accident
CX	: circumflex
DAPT	: Dual antiplatelet therapy
DBP	: Diastolic blood pressure
DCCT	: Diabetes Control and Complications Trial
DES	: Drug-eluting stents
ECG	: Electrocardiography
EF	: Ejection fraction
FBG	: Fasting blood glucose
FDG	: F-2-fluorodeoxyglucose
IABP	: Intra-aortic balloon pump
IRA	: Identification of infarct related artery

List of Abbreviations

ISIS	: International Study of Infarct Survival
KSA	: Kingdom of Saudi Arabia
LAD	: Left anterior descending
LBBB	: Left bundle branch block
LV	: Left Ventricle
LVEDD	: Left ventricular end diastolic dimension
LVEF	: Left ventricular ejection fraction
LVESD	: Left ventricular end systolic dimension
MACE	: Major adverse cardiac event
MI	: Myocardial infarction
mIBG	: Meta-iodo-benzylguanidine
MLD	: Minimal luminal diameter
NGSP	: National Glycohemoglobin Standardization Program
NSTE	: Non-ST-segment elevation
OASIS	: Optimal Antiplatelet Strategy for Interventions
OGTT	: Oral glucose tolerance test
OM	: Obtuse marginal
PCI	: Percutaneous coronary intervention
PCI	: Percutaneous coronary intervention
PLATO	: PLATelet inhibition and patient Outcomes
RAD	: Reference artery diameter
RCA	: Right coronary artery
RV	: Right ventricle
SBP	: Systolic blood pressure
STD	: ST depression
STD-R	: Segment depression resolution
STEMI	: ST-segment elevation myocardial infarction
STE-R	: ST segment elevation resolution
T	: Troponin

List of Abbreviations

TAPAS	: Thrombus Aspiration during Percutaneous coronary intervention in Acute myocardial infarction
TIA	: Transient ischaemic attack
TIMI	: Thrombolysis In Myocardial Infarction
TnC	: Troponin C
TnI	: Troponin I
TTE	: Transthoracic echocardiogram
UFH	: Unfractionated heparin
URL	: Upper reference limit
WMSI	: Wall motion score index

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Introduction

The ECG remains a simple yet powerful tool in the assessment of reperfusion efficacy and prognosis following ST-segment elevation myocardial infarction (STEMI). The current ESC and ACC/AHA guidelines advocate greater than 50% resolution of ST-segment elevation at 60–90 min following fibrinolysis as a marker of successful reperfusion. This metric is also associated with enhanced myocardial perfusion, recovery of left ventricular function, reduced infarct size, and improved outcomes. Contemporary studies have also affirmed the prognostic utility of ST-segment elevation.⁽¹⁷⁰⁾

Less attention has been given towards the evolution of concomitant ST-segment depression in patients with STEMI. The mechanism of concomitant ST-segment depression in patients presenting with STEMI continues to be the subject of debate. ST segment depression may represent: ^(191,192)

- (i) The reciprocal image of ST elevation.
- (ii) Larger, more extensive infarction.
- (iii) Ischaemia beyond the infarcted territory i.e. at a distance.
- (iv) Posterior wall injury in patients presenting with inferior infarction.

Despite uncertainty as to its mechanism, concomitant ST-segment depression has been associated with poorer clinical outcomes. It is recognized from the work of Schroder et al. and others that the extent of ST-segment deviation (elevation plus depression) defines the territory at risk and its overall resolution is prognostically relevant. However, it remains unclear whether resolution of ST-segment depression alone is associated with improved prognosis, independent of ST-segment elevation resolution.⁽¹⁷⁰⁾

Accordingly, we examined this issue working on the ECGs among 100 STEMI patients treated with IV thrombolytic therapy.

Aim of the Work

To evaluate the impact of resolution of reciprocal ST segment depression between patients with ST-segment elevation myocardial infarction (STEMI) treated with intravenous thrombolytic therapy.

Acute Myocardial Infarction

Definition of acute myocardial infarction⁽¹⁾

The term acute myocardial infarction (MI) should be used when there is evidence of myocardial necrosis in a clinical setting consistent with acute myocardial ischaemia. Under these conditions any one of the following criteria meets the diagnosis for MI:

Detection of a rise and/or fall of cardiac biomarker values [preferably cardiac troponin (cTn)] with at least one value above the 99th percentile upper reference limit (URL) and with at least one of the following:

1. Symptoms of ischaemia.
 2. New or presumed new significant ST-segment–T wave (ST–T) changes or new left bundle branch block (LBBB).
 3. Development of pathological Q waves in the ECG.
 4. Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality.
 5. Identification of an intracoronary thrombus by angiography or autopsy.
- Cardiac death with symptoms suggestive of myocardial ischaemia and presumed new ischaemic ECG changes or new LBBB, but death occurred before cardiac biomarkers