The Impact of Long Term Prognosis of Troponine in High Risk Unstable Angina

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ABSTRACT:

BACKGROUND :

To evaluate the long term prognosis (6 months of follow up) regarding mortality , acute myocardial infarction and coronary angiography results in patients with troponin positive or negative in high risk unstable angina pectoris .

METHODS :

All patients included in this study were adults, 73 patients, 52(71.24%) male versus 21(28.76%) female of different ages . All had clinical features of ischemic chest pain of high risk unstable angina. They attended private clinic in HIT city, Anbar Governorate (West of Iraq) during the period January 2010 – December 2012. All had planner ST-segment depression in electrocardiography (ECG) according to concordant ECG leads other ECG findings of T- wave inversion or ST- elevation myocardial infarction were excluded, measurement of serum troponin test was done for all patients. All patients included in the study were admitted to coronary care unit (CCU) and received full treatment including heparin and discharged from hospital when they were clinically stable. Coronary angiography was done for all patients and followed up for 6 months.

RESULTS :

From all patients included in this study 27(36.98 %) were troponin positive unstable angina, 3 (11.12%) patients of them were died and 24 (88.88 %) patients of them survived. Their coronary angiography were sever type in 11(40.74 %) patients and they did coronary artery bypass surgery(CABG) and 13(48.14 %) patients had multiple lesions in more than one vessels and need more than one balloon and stent(Percutaneous trans luminal coronary angioplasty PTCA) .While those whom troponin negative unstable angina were 46(63.02 %) patients all were survived, only 5 (10.86 %) of them need coronary artery bypass surgery, 27 (58.69 %) patients need single or multiple stents , 4(11.5 %) patients had non critical coronary artery lesion only for medical treatment and the remaining 11 (41.81 %) patients were had normal coronary angiography .

CONCLUSION :

Troponin positive high risk unstable angina carry poor prognosis where has 3 times more mortality risk and more likely to be in need for surgery and difficult stenting and may not be able to be treated surgically or by stenting but medically without intervention than negative troponin high risk unstable angina .

KEYWORDS : troponin , unstable angina , long term prognosis

INTRODUCTION :

Troponin is a component of the heart's muscle fibers, and the level of troponin in the blood is considered as the one of the most important cardiac marker used for assessing heart attacks. Troponin is the most sensitive (that is, it can be detected at low levels) and specific (its presence has a high probability of indicating cardiac muscle damage) of the cardiac markers.[1] When the heart is deprived of oxygen, the muscle fibers are damaged, and their components (including troponin) leak in to the bloodstream. Within 3 to 4 hours after a heart attack, blood levels of two types of troponin (cTnI and cTnT) begin to increase. Troponin levels peak at about 12 to 16 hours and stay elevated for up to 2 weeks[1,2]. Blood is usually drawn to check troponin levels as an individual arrives at the hospital with chest pain, and then they are checked every 4 to 6 hours after that[3]. Higher troponin levels indicate greater heart muscle damage, but even smaller heart attacks can be detected by measuring troponin[4,5]. Unstable angina is angina pectoris caused by disruption of an atherosclerotic plaque with partial thrombosis and possibly embolization or vasospasm. It is characterized by at least one of the following[6] :

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a- Occurs at rest or minimal exertion and usually lasts less than 20 minutes (if nitroglycerin is not administered) .
b- Being severe and described as flank pain, and of new onset (i.e., within 1 month).
C- Occurs with a crescendo pattern (more severe, prolonged, or increased frequency than previously).[7,8]
Fifty percent of people with unstable angina will have evidence of myocardial necrosis based on elevated cardiac serum markers such as creatine kinase isoenzyme (CK)-MB and troponin T or I, and thus have a diagnosis of non-ST elevation myocardial infarction.[8,9] According to risk stratification of unstable angina (TIMI classification) it divided to low risk and high risk according to clinical and biochemical classification where post acute myocardial infarction angina , angina at rest , angina with heart failure and troponin positive consider high risk unstable angina .[8,9]
ECG of unstable angina showed planner ST-depression ,transient ST-elevation and symmetrical T- wave inversion .[8,9,10,11,12]
The mortality rate of unstable angina is 15% .[1,2,3,4,5,6]

Unstable angina is treated in coronary care unit with heparin .isosorbid dinitrate B-blockers and or calcium channel blockers drugs with antiplatlets .Coronary angiography is indicated in high risk unstable angina [1,2,3,4,5] .The follow up of the patient either short term follow up over 30 days to 3 months or long term follow up for 6 months and more [1,2,3,4,5,6,7] .

PATIENTS AND METHODS:

All patients were adults between 40 -75 years (mean age 57.5 years) who attended the private Clinic at HIT city Anbar Governorate (West of Iraq) from January 2010 – December 2013. The ethical approval was granted by scientific researches committee of Anbar Medical College . The patients included in this study fulfilled the criteria of high risk unstable angina and all had planner ST segment depression by ECG while acute ST elevation myocardial infarction, ST-segment elevation unstable angina, T – inversion ECG ischemic heart disease ,postinfarct angina, post CABG and post PTCA were excluded . All patients (73 patients)were sent for serum troponin where labeled as troponin positive or negative high risk unstable angina .Patients were admitted to coronary care Unit and treated by heparin intravenously ,antiplatelet (aspirin and or clopidogril tablets) , isosorbid dinitrates tablets , beta-blockers and or calcium channel blockers . Angiography was done in multicenters according to patients wishes for all of them with full anti-ischemic treatment and followed up for 6 months regarding death , development of acute myocardial infarction and results of coronary angiography .
All data were analyzed using SPSS version 18 .Chi – square test used for analysis . P –Value less than 0.05 was regarded significant .

RESULTS:

In this study 27(46.98%) out of 73 (100%) patients have positive troponin unstable angina(table 1) of them 3 (11.12%) patients died and 24 (88.88 %) patients survived. The coronary angiography of them were of sever type in 11(40.74 %) patients that necessitated coronary artery bypass surgery and 13(48.14 %) patients(table 2) had multiple lesions in more than one vessels and needed more than one balloon and stent . In those whom had negative troponin unstable angina 46(63.02%) patients(table1), only 5 (10.86 %) of them needed coronary artery bypass surgery, 27 (58.69 %) patients needed single or multiple stents , 4(11.5 %) patients had non critical coronary lesion only for medical treatment and the remaining 11 (41.81 %) patients (table2) had normal coronary angiography and no patient died .

DISCUSSION:

Unstable angina is one of the commonest diseases now a day, it is risky and fatal condition for this reason this study was done to through light on the effect of troponin as long term prognostic factor in high risk unstable angina patients . Mortality rate in unstable angina is 15% [1,2] while in this study it is 11.12% which is lower due to better community awareness about risk of chest pain and early seek for advice regarding it, and better facility and development of heart ischemia management . This study showed that mortality rate in Patients with unstable angina if troponin positive were 3 (11.12%) versus negative troponin patients zero(0%) which it was significant result (P. Value 0.0001) this is possibly due to micro infarction in myocardium of troponin positive patients [3,4,5,6] which explain the three times increase in the mortality rate due to increased risk of cardiac arrhythmias, mechanical complications [7,8] and more aggressive with wide spread atherosclerosis of coronary arteries[9,10,11,12] . This is confirmed by the study results where coronary angiography findings of patients with troponin positive patients whom need CABG 11 (40.74%) versus negative troponin patients 5 (10.86 %) which were significant results (P. Value = 0.0001) . So the need for CABG is relatively four times more

common in patients with troponin positive versus negative high risk unstable angina due to advance and wide spread of atherosclerosis and even beyond PTCA measures. In this study normal angiography results appeared in eleven times more common in patients with troponin negative versus troponin positive high risk unstable angina (P. Value =0.0001) this normal coronary angiography might due to small vessel disease or vasospasm[3,4] and that prove that severity of atherosclerosis in troponin positive unstable angina is more sever and wide spread and the prognosis is more worse than troponin negative high risk unstable angina patients . These patients whom in need for medical treatment only, due to non-critical coronary artery lesion is four times more common in patients with troponin negative versus positive high risk unstable angina (P. Value =0.0001) and this result reflects that troponin negative is less in risk and severity. Thus patients who are candidate for single or multiple stents are relatively double in troponin negative versus positive high risk unstable angina
(P.value=0.0001). That mean the manipulation of PTCA in troponin positive high risk unstable angina is difficult and may need more than one balloon and stent than troponin negative high risk unstable angina . From all results showed that troponin positive high risk unstable angina carry three times risk of mortality rate among patients and more sever angiography results regarding the need for surgery , difficult and complex stenting of coronary arteries and wide spread atherosclerotic coronary arteries .

Table 1: Frequency and distribution of patients .

Troponin = +ve patients NO. %		Troponin = --ve patients NO. %		Total
27	(46.98)	46	(63.02%)	73 (100%)

Table 2 : Distribution of Coronary angiography results.

number of patients	Normal coronary angiography No. %	Did Multiple or single stenting No. %	Did CABG No. %	died No. %	Non critical lesion for medical treatment only No. %
Total patients 72(100 %)					
Troponin +ve 27 (46.98%)	0 0%	13 48.14%	11 40.74	3 11.12	0 0%
Troponin –ve 46(63.02%)	11 41.81	27 58.69%	5 10.86	0 0 %	1 4 11.5 %

$X^2 = 18.45$ P. Value = 0.0001 Significant
df. = 3

CONCLUSION:

Troponin is good prognostic indicator in high risk unstable angina patients that can preclude the fate of the positive troponin patients that need aggressive management in coronary care unit and early coronary angiography for them to save their life . While troponin negative high risk unstable angina patients can be discharged from coronary care unit safely when the patient is stable with less expected risk of mortality and less atherosclerosis of coronary arteries and easily manipulated and less balloon and stenting need of their coronaries during angiography with good outcome. in order to get more representative results I recommend the carry out of the future study on more number of patients for longer follow up period .

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