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Short Communication

REVIEW OF TREATMENT PLANS USED FOR ACUTE MYOCARDIAL INFARCTION IN ISLAMABAD, PAKISTAN

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ABSTRACT:

Myocardial infarction is simply due to decreased supply of oxygen and blood to the particular tissue of heart which ultimately leads to the death of tissue. Naturally heart is quite stable in its involuntary action due to balance between oxygen supply and oxygen demand of the cardiac muscle. when this balance is disturbed by the clot formation(atherosclerosis) in coronary artery or increased demand of oxygen due to increased heart rate then clinical situation arises as tightening of chest,laboured breathing, sweating and radiating pain originating form chest and terminating to left arm and jaws as well. A male of 55 years was hospitalized in one of the most well reputed hospital of Federal area of Pakistan. The patients was nimble due to cold sweating, sever radiating left sided chest pain and was in the state of fear and apprehension. As an acute case of M.I, patient was initially treated with thrombolytic agent, Streptokinase injection 1.5 MIU through I.V infusion in one hour, tab lowplat (Clopidogrel), tab Loprin (asprin), tab Lasix (Diuretic) and tab digoxin 0.25 mg for limited days. Urine and blood samples were collected to investigate the cause and mitigate the worst clinical situation. Laboratory finding showed normal results and controlled lipid profile. Most important cardiac enzymes were in normal function .After the six days of careful monitoring, patient was discharged by prescribing tab loprin75 mg,tab lowplat 75 mg tab Lasix 40 mg,tab digoxin 0.25 mg and with precautionary measurements regarding diet control to prevent another incidence.Inview to provide aggressive therapy to save life in emergency situation, rational use of medicinal agents was neglected and prescription errors have been identified which can further worse the situation.

Keywords: Myocardial infarction, atherosclerosis, Diuretic

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INTRODUCTION

Myocardial infarction is second leading disease of cardiovascular system after the hypertension that result from the stressful and competitive environment of present age.

It has been reported that more than one million patients have been hospitalized every year in U.S.A.(American Heart Association. 2002). Myocardial infarction usually results from the imbalance between oxygen supply and its demand (Richard, 2007).Increase load on the heart leads to the increase demand of oxygen and nutrition by means of blood. If this supply of oxygen or nutrition by means of blood to the heart is reduced due to obstruction in coronary artery (clot formation or thrombus) results in ischemia of cells and this is start of myocardial infarction. Myocardial infarction is usually diagnosed in two categories with the help of ECG,(A) Non ST elevated Myocardial Infarction (NSTE MI),and ST elevated Myocardial infarction(STEMI).Most of the case are diagnosed as non ST segment elevated on their electrocardiograph paper in the start of disease.

(Braunwald E,2000).Early diagnosis and improved acute treatment plan in ST segment elevated patients can lead to the improved management of complications, available pharmacological and mechanical therapies has significantly reduced the cardiac morbidity and mortality(Ryan TJ,1999; Grines CL,1993; Zijlstra F,1993; Suryapranata H,1998; Stone G,2002).Treatment plan is usually followed according to the guideline provided by American Heart Association(AHA/ACC).This association has separate treatment protocol for the ST elevated and non ST elevated patients of myocardial infarction. According to these guidelines, every patient with MI must be provided ventilation and some pharmacological agents like lower doses of asprin,fibrinolytic agents, beta blockers and nitroglycerine(in the start of therapy).Other than pharmacological treatment plan,AHA also suggested some mechanical procedure to minimize the mortality rate due to MI.

Our present short communication will elaborate the comparison between treatment protocol adopted by the cardiologist and treatment guidelines offered by international community for the better treatment of myocardial infarction.Furthermore, this study of particular case will highlight the rational use of drugs in acute interior wall myocardial infarction.

CASE REPORT

An old man of 55 years of age was brought in the casualty ward of federal government hospital with left sided chest pain radiating from chest and penetrating to the left arm and jaws. Patient was shedding his cold sweat and was in the state of apprehension. Available Health care provider started early investigation parallel with the treatment. It was suspected from the evident signs and symptoms that this is an acute case of myocardial infarction .Blood and urine samples were collected and sent to the laboratory for expert opinion and convert their suspect case into exact case of myocardial infarction. In the mean while, patient was given intravenous infusion of injection streptokinase 1.5 M I.U. (A thrombolytic agent) in one hour, tablet lowplat (Clopidogrel) platelet aggregation inhibitor, another drug of same class tablet Loprin (Aspirin),one tablet in a day, tab Limitrol 10 mg at the time of need. This was emergency treatment protocol given to the patient. After few hours injection Lasix (Diuretic) has been given and then patient was treated with injection Norpine (Catecholamine) then with injection Dopamine at the infusion rate of 8-12 drops per minut.In the mean time tablet digoxin 0.25 mg

was recommended in twice a day dose. It was surprising to observe that treatment given after the primary cause was ionotropic and chronotrpic in its action while in myocardial infarction we have to reduce these activities. All laboratory finding showed normal results of lipid profile, cardiac enzymes, renal and liver function tests with one insignificant exception that AST (aspartate transaminase) with value of 46 u/L versus normal value which is 35 u/L.ECG finding showed ST segment elevation which lead to the evidence of acute interior wall myocardial infarction. This patient has no family history of drug and disease like hypertension and diabetes, risk factor like obesity is negative and smoking is positive and was busy in daily routine activities. Beta blockers are not recommended which are used to reduced the workload of heart and diuretic and digoxin have been recommended which find their no role on myocardial infarctions.

DISCUSSION

The Case study under discussion reported that patient has no family history of hypertension and diabetes. No risk factor like obesity, hypertension and diabetes present except for smoking. Smoking seems to be dominant factor for this illness. Death reported with acute attacks of angina pectoris is minimum as compared to myocardial infarction because these attacks are transient (fifteen seconds to fifteen minutes).(Richard, 2007). It is well established fact that clear relationship exist between the mortality and time delay in the treatment from onset of the symptoms in patients with ST EMI treated with thrombolytic(Fibrinolityc Therapy Trialists' (FTT) Collaborative Group,1994)(Zijlstra F, 2002)(Newby LK,1996). STEMI is becoming to be a significant public health issue in industrialized countries and is going to be an emerging problem in developing countries.(Rogers WJ,2000).According to guidelines provided by AHA for the ST elevated myocardial infarction, at the time of onset of signs and symptoms, one tablet of nitroglycerine sublingually, after every 5 minutes up to 3 doses before calling casualty observations, can greatly reduce the intensity of the pain.(US Department of Health and Human Services,2001)(Eisenberg MJ,1996).Injection streptokinase was given in infusion rate of 10-12 drops per minute support the importance of fibrinolytic agents at the emergency time. Early use of fibrinolytic agent not only reduce the ischemic type chest discomfort but also will reduce the mortality due to attacks.(GISSI,1986)(Armstrong PW,2003).Enteric coated Aspirin was recommended at the dose of 75 mg once in a day which justify its use as per guide lines of AHA but dose of the drug need to be adjusted. In a dose of 162 mg or more, aspirin produces a rapid clinical antithrombotic effect caused by immediate and near-total inhibition of thromboxane A2 production.Asprin found to be effective in suspected case of STE MI and dose should be between 175-325 mg in acute cases and 75 mg continued dose for indefinite time.(Antithrombotic Trialists' Collaboration,2002) Although some trials have used enteric-coated aspirin for initial dosing, more rapid buccal absorption occurs with non–enteric-coated formulations.(Sagar KA,1999). According to American Heart Association (AHA),It is reasonable to administer beta-blockers promptly to STEMI patients without contraindications, especially if a tachyarrhythmia or hypertension is present. Overwhelming results have been observed in the NSTE MI patients without contraindications to their use. In this case, beta blockers have not been prescribed which leads to the question mark and failure to understand the protocols of the disease.Frusemide diuretics have been recommended in both infusion and oral dosage form which find its no use except for pulmonary congestion while sign and symptoms reported no such type of complications.Iontropic agents like norepinephrine and dopamine have

been recommended which might increase oxygen demand of the heart, can worst the situation. According to AHA/ACC,only condition in which ionotropic agents justify their use is bradycardia or CHF.This pathological condition actually potentiated by the aggressive dose of diuretic(Frusemide) which resulted in the decrease in blood pressure. In order to overcome this prescription error, ionotropic agents and cardiac glycoside have been recommended. Cardiac glycosides and Loop diuretic(Frusemide) greatly reduce the potassium level of the body further leading to the weakening of heart muscle and bradycardia. In the whole tenure of hospitalization, patient blood pressure could not exceed from 100/40 mmof Hg which further threatened the risk of kidney failure. Glycoprotein II a/III b inhibitors are prescribed together for the long time management of the disease which contradict with the guidelines of AHA for ST elevated myocardial infarction patient that only smaller doses of Aspirin 75mg is sufficient to mitigate the future attacks.Clopidogrel and Aspirin both can further cause bleeding disorder or can produce results which are therapeutically not required.AHA further suggest that if pathological conditions of the patient is not improving then mechanical therapies like CABG(coronary artery bypass grafting) should be performed.

CONCLUSION

In the context of above mentioned discussion, it can be concluded that it is important to follow the AHA guide lines for the treatment of myocardial infarction which not only mitigate the symptoms of that life threatening clinical condition but also prevent secondary complications. In case of angina, typical antianginal drugs should be prescribed at priority like beta blockers, nitrates and calcium channel blockers. Diuretics and digoxin may find their use in some particular conditions but should not be used as typical agents for angina.

RECOMMENDATION

Follow the guidelines of American Heart Association for myocardial infarction which are as under,

1. Nitrates should be given before pre hospitalization after 5 minutes interval up to 3 doses.
2. Aspirin should be prescribed at maximum dose of 175-325 mg in start and then 75 mg dose for indefinite time period.
3. Beta blockers should be recommended to reduce the work load of heart which ultimately reduces the oxygen demand.
4. Calcium channel blockers can be recommended in some particular situations like hypertension and coronary vasodilatation.
5. Glycoprotein IIb/IIIa inhibitor shown to be effective not only in emergency situation but also reduces the frequency of future episodes.
6. Proper ventilation and regular walk can alleviate the severity of disease.
7. Mechanical procedures are part of therapy and must be considered when it is inevitable.

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