Available online at www.sciencedirect.com

ScienceDirect

Chronic Diseases and Translational Medicine 1 (2015) 81–88

www.keaipublishing.com/en/journals/cdtm/

www.cdatm.org

Original article

Influence of Tirofiban maintenance duration on patients with acute myocardial infarction treated by percutaneous coronary intervention

Zhen-Guo Ji [a,*], Hong-Bin Liu [a], Zhi-Hong Liu [a], Guo-Ping Ma [b], Li-Qiang Qin [a], Wei Dong [a], Li-Ya Wang [a]

[a] *The Third Affiliated Shijiazhuang Hospital of Hebei Medical University, The Third Hospital of Shijiazhuang City, Shijiangzhuang, Hebei 050011, China*

[b] *The First Hospital of Hebei Medical University, Hebei 050031, China*

Received 21 January 2015

Available online 6 July 2015

Abstract

Objective: To evaluate the efficacy and short term prognosis of Tirofiban in different treatment duration in patients with acute ST segment elevation myocardial infarction (STEMI) and percutaneous coronary intervention (PCI) combined with intracoronary injection.

Methods: A total of 125 patients with acute STEMI were enrolled in this study. They were randomly divided into two groups: control group ($n = 61$) and Tirofiban group ($n = 64$). The Tirofiban was used by intracoronary and intravenous administration in Tirofiban group which was randomly divided into three sub-groups according to the duration of Tirofiban by persistent intravenous injection for 12 hours, 24 hours or 36 hours. Thrombolysis in myocardial infarction flow and myocardial perfusion grades were recorded immediately after PCI. The adverse cardiac events and cardiac death within 180 days of PCI, and the adverse effects (hemorrhage and thrombocytopenia) were compared between the two groups and within Tirofiban sub-groups.

Results: Grade 3 in myocardial perfusion was significantly better in Tirofiban group than control group (85.94% *vs.* 72.13%, $P = 0.03$) after PCI. There was one cardiac death in control group in 180 days after PCI. The adverse cardiac event rates between two groups was significant difference (16 patients in control group and only 8 in Tirofiban group, $P = 0.047$). There was no significant difference in incidence of hemorrhage complications and platelet counts between two groups. Nevertheless, hemorrhage complications in the 12- and 24-hour subgroups were less than 36-hour subgroup ($P = 0.01$).

* Corresponding author. Tel.: +86 311 85990692; fax: +86 311 85990501.
E-mail address: jzg6301@163.com (Z.-G. Ji).

Peer review under responsibility of Chinese Medical Association.

Production and Hosting by Elsevier on behalf of KeAi

http://dx.doi.org/10.1016/j.cdtm.2015.06.003

Conclusions: Intravenous Tirofiban treatment reduced the adverse cardiac events and improved short term prognosis without increasing the adverse reactions of the drugs in patients undergoing PCI. The less rate of hemorrhage complication can be achieved in short-duration of Tirofiban by intravenous injection after PCI.

Keywords: Platelet glycoprotein IIb/IIIa inhibitor; Acute ST segment elevation myocardial infarction; Coronary artery; Percutaneous coronary intervention

Introduction

Percutaneous coronary intervention (PCI) is an important and the effectivest method used to revascularize the target vessel and to save the life of patients with ST-segment elevation myocardial infarction (STEMI).[1,2] Clinical randomized trials and observational studies have demonstrated that adjunctive infusion of glycoprotein (GP) IIb/IIIa inhibitors (intravenous and intracoronary bolus administration) is associated with improved clinical outcomes and further reduced mortality of the patients with STEMI.[3−5] Standard Tirofiban regimen consists of an intravenous (IV) bolus followed by an intracoronary (IC) bolus administration and 12−72 h IV infusion.[6,7] However, whether longer duration of Tirofiban IV infusion would result in improved clinical outcomes and decrease the incidence of complications or not is unknown. The aim of this study was to compare the efficacy and prognosis of intracoronary bolus followed by different duration of IV maintenance infusion of Tirofiban with respect to improvement in outcomes and complications after PCI.

Methods

Patient selection

125 patients with STEMI and age <80 years admitted to The First Hospital of Hebei Medical University and The Third Hospital of Shijiazhuang City from April 2010 to February 2012 were enrolled in this study. Inclusion criteria: ST-segment elevation of two adjacent leads >0.1 mV, presenting within 12 hours of symptom onset and admission. All the patients underwent primary PCI by the right radial approach with Thrombolysis In Myocardial Infarction (TIMI) flow grade in the infarction related artery (IRA) which was described as grade 0 or 1. Only IRA underwent intervention. Patients who had any one of the following conditions were excluded from the study: (1) cardiac function class III and IV (Killip classification); (2) definite resistance or allergy to anti-platelet drugs; (3) severe hypertension (blood pressure >180/110 mmHg, 1 mmHg = 0.133 kPa); (4) previous history of cerebral hemorrhage or cerebral infarction in the last six months or visceral hemorrhage in recent one month; (5) blood coagulation disorders and platelet count $<100 \times 10^9$/L; (6) serum creatinine >177 μmol/L, hemodialysis patients; (7) history of heparin-caused thrombocytopenia and heparin allergy; (8) left main artery stenosis >50% or severe triple vessel lesion; (9) unable to complete the procedure by radial artery and not willing to participate in the study; (10) Non-STEMI or undergoing PCI or coronary artery bypass grafting procedure in six-month.

After initial evaluation and coronary artery angiography (CAG), a total of 125 eligible patients were randomly (simple randomization) divided into two groups: control group (intracoronary saline, $n = 61$) and study group (intracoronary Tirofiban, $n = 64$) with maintenance infusion for 12 h, 24 h or 36 h. All the patients gave a written informed consent and institutional ethics committee approved the study.

Medication scheme

All the patients received pre-treated with aspirin (300 mg) and clopidogrel (600 mg) immediately before CAG with heparin 3000 IU via the radial artery. After the diagnostic CAG was performed, an initial intravenous bolus dose of 100 IU/kg and a maximal dose of 10000 IU was given. The maintenance dosage was adjusted according to the values of activated clotting time (ACT) which were closely monitored during PCI for a total of 250−300 seconds. Primary PCI was performed according to routine procedures. Tirofiban bolus (study groups) or saline (control group) was administered after successful passage of guidewire with/without predilatation by a balloon immediately after the first restoration of antegrade flow. The patients in Tirofiban group received a bolus dose of Tirofiban 10 μg/kg via IC through the guiding catheter in the IRA over a period of 30 s, followed by a 12 hours (12 h