Study of the risk factors of postoperative upper gastrointestinal bleeding of percutaneous coronary interventional therapy

Zhenxiang Zhang*, Wei Zheng, Junling Li

The Second Affiliated Hospital of Zhengzhou University, *Zhengzhou*, *Henan* 450014, *China*

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Abstract

Objective. Investigate the risk factors of postoperative upper gastrointestinal bleeding of percutaneous coronary interventional (PCI) therapy. *Methods*. From March of 2005 to 2008, application of Logistic multiple stepwise regression analysis and forecasting factor screening Fishers discrimination mode, we have studied 152 cases for postoperative upper gastrointestinal bleeding of PCI therapy in the Second Affiliated Hospital of Zhengzhou University. *Results*. The incidence of upper gastrointestinal bleeding is 0.3% (5/152). Meanwhile, Logistic regression analysis showed that the risk factors of upper gastrointestinal bleeding are associated with elderly age and postoperative using heparin and Tirofiban. *Conclusion*. Early identification of risk factors can reduce the risk of gastrointestinal bleeding of PCI for postoperative patients. [Life Science Journal. 2009; 6(2): 63 – 64] (ISSN: 1097 – 8135).

Keywords: coronary heart disease; angioplasty; upper gastrointestinal bleeding; PCI

1 Introduction

Manoukian *et al* reported[1] that up to 30% patients of acute coronary syndrome and of coronary heart disease with percutaneous coronary intervention (PCI) treatment are in suffering of bleeding complications. Patients with immediate bleeding and the long-term poor prognosis with hemorrhage is closely related[2,3]. Both Anticoagulation and antiplatelet therapy are the must in the treatment of patients with coronary heart disease to reduce the occurrence of ischemia but also may increase the tendency of bleeding. This report demonstrated 152 case-studies on gastrointestinal bleeding risk factor of PCI patients with coronary artery disease were retrospectively analyzed and discussed.

2 Cases Study

From March 2005 to 2008, 152 PCI (88 of male and 64 of female aged from 37 to 77 years old patients) cases were studied. Among the patients, there are 63 cases for acute myocardial infarction, 56 cases for unstable angina pectoris, and 13 cases for remote infarct as well as 20 cases for ischemic cardiomyopathy excluding ischemic heart valve disease, serious, myocarditis, arrhythmia, liver function is not complete, chronic obstructie pulmonary emphysema, etc. However, patients were administrated with nitrate, beta blockers and calcium channel blockers, statins, aspirin, clopidogrel and other drugs with PCI therapy.

Clinical observation. Before the operation for routine PCI platelet counts, blood clotting time, prothrombin were carefully recorded and measured for all the cases. In the use of heparin and Tirofiban, platelet counts, blood coagulation time, thrombinogen reaction time and fecal occult blood test with specific criteria, such as blood platelet count test must be less than 20×10^9/L and APTT test must be longer than 180 seconds etc., all carefully being performed has obviously shown the bleeding tendency. Moreover, positive fecal occult blood test indicated the early gastrointestinal bleeding. Clinically, we observed the bleeding of gums indicating the administration of heparin and Tirofiban may cause early bleeding being observed. Administration of heparin and Tirofiban may also cause the bleeding tip coagulated time longer

*Corresponding author. Email:

than regular 2 to 3 minutes for intravenous administration and much dressings oozed blood or local hematoma for the PCI postoperative care,

3 Results

Recording age, gender, alimentary basic diseases, PCI duration and complications preoperative and postoperative, side effects of using heparin and Tirofiban, proton pump inhibitors, platelet count and blood clotting PT and PTT as the data base, by using SPSS and Logistic regression analysis, we set up parameters and proposed a model for bleeding risk factor calculation as following:

$P = \exp(-14.253 + 0.152 \times \text{age} + 2.602 \times \text{concentration of heparin and Tirofiban})/[1+\exp(-14.253 + 0.152 \times \text{age} + 2.602 \times \text{heparin and Tirofiban})]$

According to the model, we conclude the ROC curve at 0.961 (95% CI: 0.911 – 1.010) and standard error is 0.025. In the mean time, increasing age may increase the risk of bleeding of PCI therapy.

Table 1. The risk factors of postoperative upper gastrointestinal bleeding of PCI therapy

parameters	B	SE	Wald	*P*	Exp (B)	95% CI
Age	0.152	0.067	5.214	0.022	1.164	1.022 – 1.326
Heparin and tirofiban	2.602	1.032	6.357	0.012	13.487	1.7859 – 101.931
Constant	– 14.253	4.851	8.634	0.003	< 0.0001	

B: partial regression coefficient; SE: standard error of partial regression coefficient; Exp (B): relative risk RR.

If substitute age, heparin and Tirofiban (two risk factors) to Fisher formula, we can get the discriminant function

$Y = 0.647 \times \text{age} + 0.774 \times \text{concentration of heparin and Tirofiban}$

By using cross validation to evaluate the reliability, we can get the accuracy of discriminant function of 84.2%.

4 Discussion

In order to avoid the PCI postoperative stent acute thrombosis, Heparin and Tirofiban can be used for therapy. Through the anticoagulant III enzyme, heparin can inhibit the function of II a, IX a, X a plasma thromboplastin component (PTC) and therefore within 10 minutes of injection can significantly prolong the blood clotting, thrombin enzyme activity and hemoglutination[4,5]. Through inhibiting platelet by glycoprotein II b/III receptor to exert the function of antiplatelet agents, Tirofiban can provide the function of anticlotting. Anticlotting drugs can directly cause gastrointestinal mucosa bleeding[6]. For senior patients, due to the physiological degradation, heparin and Tirofiban combination therapy may have high risk of gastrointestinal bleeding which truly match the calculation from our prediction model.

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