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ORIGINAL ARTICLE

Bleeding with Tirofiban During Percutaneous Coronary Intervention

MUHAMMAD WAQAS[1], MUHAMMAD SHAHZAD AZEEM[2], MUHAMMAD QASIM KHAN[3]
[1]Medical Officer Deptt. of Cardiology, Jinnah Hospital, Lahore
[2]Senior Registrar, Deptt. of Cardiology, Jinnah Hospital, Lahore
[3]Medical Officer Deptt. of Cardiology, Jinnah Hospital, Lahore
Correspondence to: Shahzad Azeem, Email: shahzadazeem7@hotmail.com, Cell: 03366911718

ABSTRACT

Objective: To determine the frequency of bleeding with Tirofiban during percutaneous coronary intervention

Methodology: In this case series (Descriptive) at Mayo Hospital, Cardiology Deptt. Lahore during the year 2018 and 2019, we enrolled a total of 385 cases of either gender with acute coronary syndrome(ACS) and undergoing percutaneous coronary intervention(PCI)were included. Preloading with aspirin 300 mg and clopidogrel 600 mg was done. Intravenous Tirofiban was given keeping in mind the current guidelines. Tirofiban was given as I/V bolus of 0.25 mcg/kg over 5 minutes during/before the start of PCI. It was followed by a continuous infusion of 0.125 mcg/kg/min for up to eighteen hours. Bleeding during and within 24 hours of percutaneous coronary intervention was noted according to BARC bleeding type

Results: Mean age was 50.750± 5.63years. Male gender was dominant i.e. 85.7% as compare to 14.3% females. Bleeding was observed in 3.9% patients

Conclusion: In acute coronary syndrome patients undergoing PCI, Tirofiban use was associated with bleeding. In the modern era of PCI, the judicious use of Tirofiban is safe.

Keywords: Percutaneous coronary intervention, Tirofiban, Bleeding, Acute coronary syndrome

INTRODUCTION

Percutaneous coronary intervention (PCI) is known as an effective method of treatment in patients presenting with acute coronary syndrome (ACS). However, a significant proportion remains impaired of micro-circulation, leads to serious complications.[1]

No-reflow is considered an exclusive predictor of prognosis.[2] Its pathological mechanism include injury related to ischemia reperfusion, distal thromboembolism, endothelial dysfunction, neutrophilic plugging, diffuse myocardial edema, and spasms of the microcirculation.[3]It is found that distal thromboembolism results in detachment of embolic particles as a common phenomenon which is considered as a potential reason for no-reflow.[4]

Various drugs are helpful to treat and prevent no-reflow, such as Glycoprotein IIb/IIIa inhibitor (GPI)Tirofiban, nicorandil, adenosine, diltiazem, verapamil, sodium nitroprusside, adrenaline, nitroglycerin, and anisodamine.[5,6]Tirofiban, is an effective antiplatelet agents available, helps in inhibitionof activation, adhesion, and importantly aggregation of platelets, which reduces inflammatory factors release, and improves endothelial function.It is found with a significant benefit for the restoration of antegrade coronary flow of the occluded vessels, treating/preventing no-reflow and also reduces the rate of ischemia events.

Various studies are evident that intracoronary (IC) administration of Glycoprotein Tirofibanresults in good clinical outcome as compared to those administered intravenously.[7,8] However, intracoronary administration does not lead to optimal contact between the lesion and the Tirofiban, which are washed out in very short time by coronary flow. Whether intralesional (IL) administration, which can achieve a higher local drug concentration, offers a better choice is controversial.

Current ESC guidelines state that “it is reasonable to combine a GP IIb/IIIa receptor inhibitor Tirofiban with aspirin and a P2Y12 inhibitor for patients with ACS undergoing PCI with a high risk of procedural MI and without a high risk of bleeding”.[9] However, side effect concerns restricts their usage, especially with in-addition of advanced potent oral antiplatelet drugs.

In a study by Safley DM, et al. has showed that frequency of bleeding was 3.7% with Tirofiban during percutaneous coronary intervention.[10]In another study by Howard JP, et al. has showed that frequency of bleeding was 4.17% with Glycoprotein Tirofiban during percutaneous coronary intervention.[11]

Scarce data is available on this issue. Results of above studies cannot be generalized in our population because it is not possible to derive a “one size-fits-all” recommendation on the basis of their findings. The rationale of this study is to get evidence in this subject by determining the frequency of bleeding withTirofiban during percutaneous coronary intervention in our local population. Results of this study will pave the way for further research in this subject by future researchers.

METHODOLOGY

We enrolled a total of 385 cases of either gender with ACS and selected for PCIwere included. Preload administration of aspirin 300mg in addition to clopidogrel 600mg was done. Tirofiban was administered intravenously with the dose of 0.25 mcg/kg over 5 minutes before/during the procedure and further infusion was continued to0.125 mcg/kg/min for up to 18 hrs. Bleeding during and within 24 hours of percutaneous coronary intervention was noted according to BARC bleeding type.

RESULTS

Mean age of the patients was 50.750± 5.63 years and mean weight was 87.826±9.22 Kg as shown in Table-I. Male gender was dominant i.e. 85.7% as compare to 14.3% females as shown in Table-II.

Bleeding was observed in 3.9% patients as shown in Table-III.

Table-I: Mean± SD of age and weight n=385

Demographic variables	Mean ± SD
Age(years)	50.750± 5.63
Weight (Kg)	87.826±9.22

Table- II: Frequency and %age of patients according to gender

Gender		No. of Patients	%age
	Male	330	85.7%
	Female	55	14.3%
	Total	385	100%

Table- III: Frequency and %age of patients according to bleeding

Bleeding		No. of Patients	%age
	Yes	15	3.9%
	No	370	96.1%
	Total	385	100%

DISCUSSION

In our patients, who were 30-60 years of age, glycoprotein IIb/IIIa inhibitor tirofiban was administered during PCI, BARC bleeding type 2 and 3 was observed in 3.9% patients. A surgical procedure was not necessary. Our findings of bleeding complications in patients are comparable than those reported in the international studies. Thus Use of glycoprotein IIb/IIIa inhibitor Tirofiban during PCI in this specific patient population is safe.

Safley DM, et al. showed in their study that frequency of bleeding was 3.7% with Glycoprotein IIB/IIIA inhibitors during PCI.[10] In another study by Howard JP, et al. showed that frequency of bleeding was 4.17% with Glycoprotein IIB/IIIA inhibitors during percutaneous coronary intervention.[11]

Within our study population, access site closure was done by manual compression for 10 to 20 minutes 6 hours post PCI in case of femoral access and 2 hours post PCI in case of radial access with glycoprotein IIb/IIIa inhibitors. This may contribute to the slightly increased rate of minor access site complications like hematoma at access site (observe in 5 patients) and retroperitoneal hematoma (observe in1 patient). in treated with glycoprotein inhibitorTirofiban.Self limiting gum bleed recorded in thirty cases and epistaxis in 9 cases. Hematuria was noted in 2 patients with Type 3a BARC bleeding among them one patient had history of renal stones. BARC type 3b upper GI bleeding observed in1 patient who was HCV positive and varices discovered on endoscopy. No BARC type 3c and type 5 bleeding observed in any patient .However, as a limiting factor of our study, time of sheath removal could have influenced the rate of local bleeding complications. Removal guided by activated clotting time could increase its safety.

Management of CAD and ACS should be based on evaluation of individual mortality and bleeding risk (HAS-BLED score). In the setting of an increased mortality and low bleeding risk, the option of peri-interventional glycoprotein IIb/IIIa inhibitor therapy should be considered. With careful patients selection the potential treatment benefit would surpass the slightly increased risk for bleeding complications.

There is clear evidence supporting the clinical benefits of glycoprotein IIb/IIIa inhibitor Tirofiban treatment in PCI. The initial drawback of hemorrhagic complications was overcome by the use of vascular closure devices. Minor increase in bleeding may be expected when glycoprotein IIb/IIIa inhibitors is given. However, it may not be prevented to offer the patients, as there is no threat of major bleeding complications. In this specific population, the broader use of vascular closure devices may result in lower rate of access site complications.

CONCLUSION

It is concluded that In acute coronary syndrome patients undergoing PCI, Glycoprotein IIB/IIIA inhibitor Tirofibanuse was associated with bleeding. In the modern era of PCI, the judicious use of GPIs(tirofiban)is safe in carefully selected population.

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