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Short-term outcome of single-bolus dose of eptifibatide during percutaneous coronary intervention (PCI) in a tertiary level hospital in Bangladesh

Syed Ali Ahsan, Md. Abu Salim *, Ayesha Rafiq, Abu Siddique, S.K. Banerjee, Harisul Haque, Manzoor Mahmood

Department of Cardiology, Bangabandhu Sheikh Mujub Medical University (BSMMU), Shahbagh, Dhaka, Bangladesh

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KEYWORDS
Eptifibatide in PCI;
Single bolus dose;
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Abstract
Objectives: To evaluate the effectiveness of a single bolus dose of eptifibatide in elective percutaneous coronary intervention.
Methods: The outcomes of 85 consecutive patients who underwent elective coronary stenting from January 2007 to December 2007 were assessed prospectively. Forty-four patients received eptifibrate (15 mg single bolus dose) after crossing the lesion and 41 patients did not receive eptifibatide. All patients were treated with aspirin and clopidogrel before and after the procedure and all received a single bolus dose of clopidogrel (300 mg) before the procedure. All patients received weight-adjusted doses of heparin before and after the procedure. The primary endpoint for the study was the 30-day incidence of death, myocardial infarction, urgent repeat revascularization or in-hospital major bleeding. Major adverse cardiac events were assessed during hospitalization and one month post-procedure. CK-MB was measured post-procedure in all symptomatic patients.
Results: Mean age of Group I (Eptifibatide used) was 52.34 ± 8.90 years, and Group-II (Eptifibatide not used) was 49.68 ± 8.87 years. In group-I 38.63% had history of Myocardial Infarction (MI), 9.09% had history of Unstable angina (UA), 52.27% had history to chronic stable angina (SA), 54.54% was hypertensive, 40.90% were diabetic, 63.63% had dyslipidemia; 56.81% was diagnoses as single vessel disease (SVD), 36.36% was double vessel disease (DVD). Among group-II patients, 36.58 5 had history of MI, 12.19% had history of UA, 51.21% had history of SA, 51.21% was hypertensive, 26.82% was diabetic, 60.97% had dyslipidemia, 63.41% was diagnosed as a SVD, 29.26% was DVD. In short term (one month) outcome, Group I patients had

* Corresponding author.
E-mail address: drsalimsn@hotmail.com (M.A. Salim).

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statistically significant less complications in comparison to Group-II patient ($p = 0.017$). In Group-I only 2.27% had Q wave MI AND 2.27% had minor bleeding complication, whereas in Group-II patients 9.76% had Q wave MI, 7.32% had Non-Q MI and 4.88% needed target vessel revascularization again.

Conclusion: Single-bolus eptifibatide is a safe and highly cost-effective alternative to conventional regimens.

Introduction

Eptifibatide, a potent inhibitor of platelet aggregation, acts by competitive inhibition of the GP IIb/IIIa receptor [1]. The action is rapid and short lived because of a relatively short half-life. It has been shown to reduce the incidence of non-ST segment elevation myocardial infarction (NSTEMI) in both urgent and elective PCI in large clinical trials [2—7]. In practice, GP IIb/IIIa inhibitors are given as an IV bolus followed by a prolonged infusion for 12—18 h. Bleeding and cost limits the use of GP IIb/IIIa inhibitors in many patients undergoing PCI.

Clinical relevance of prolonged GP IIb/IIIa inhibitors came under scrutiny due to widespread use of stents thereby decreasing the problem of abrupt closure with preloaded high dose of clopidogrel (300—600 mg) which achieved an antiplatelet effect within 2—4 h [8—9] Prolonged infusion of GP IIb/IIIa inhibitors are complicated by increased bleeding complications without an incremental anti-ischemic effect instead of bolus adminstration.

The current study evaluates the use of high-dose eptifibatide as a single bolus to patients undergoing elective PCI. We compared single high dose eptifibatide with conventional bolus plus maintainance infusion regemin in terms of safety, effectiveness and cost.

Methods

This is a prospective observational trial. Prospective assessment was conducted of 85 consecutive patients who underwent elective coronary stenting between January 2007 and December 2007 at the Bangabandhu Sheikh Mujib Medical University Hospital.

Patients in this study have been enrolled for PCI as they had either stable or unstable angina with at least one lesion of >70% stenosis by visual estimate and were suitable for stenting. Patients who had saphenous graft stenosis, who required rotational atherectomy or brachytherapy were excluded from the study. All patients were treated with aspirin pre- and post-procedure, clopidogrel bisulfate (300 mg) loading pre-procedure, and weight-adjusted unfractionated heparin (10,000 units). Of the 85 patients, 41 received eptifibatide (15 mg single bolus) after crossing the lesion and 44 did not.

Modified seldinger technique with 7F sheaths using the femoral approach was used in all patients. Good stent apposition and reduction of sub-acute stent thrombosis was ensured by high pressure stent deployment. Manual compression was given during sheath removal in all cases. A residual stenosis of <30% post-procedure was termed as ''procedural success''. Primary endpoint of this study included: 30 days incidence of (1) death, (2) myocardial infarction (MI), (3) urgent repeat PCI, (4) in-hospital major hemorrhage. Deaths from any cause like, MI, urgent target vessel revascularization (TVR) by PCI or CABG and/or major in-hospital bleeding complication were included.

Statistical analysis

Data are presented as mean ± standard deviation and percent as appropriate. *T*-test was used to compare the eptifibatide and non-eptifibatide groups. A p value $\leqslant 0.05$ was considered significant.

Results

Of the 85 patients, 44 was in Group I (Eptifibatide used) and 41 was in Group II (Eptifibatide not used).Mean age of Group I patients was 52.34 ± 8.90 years, and Group II patients was 49.68 ± 8.87 years. In Group I, 38.63% had history of myocardial infarction (MI), 9.09% had history of unstable angina (UA), 52.27% had history to chronic stable angina (SA), 54.54% was hypertensive, 40.90% were diabetic, 63.63% had dyslipidemia; 56.81% was diagnoses as single vessel disease (SVD), 36.36% was double vessel disease (DVD). Among Group II patients, 36.58 5 had history of MI, 12.19% had history of UA, 51.21% had history of SA, 51.21% was hypertensive, 26.82% was diabetic, 60.97% had dyslipidemia, 63.41% was diagnosed as a SVD, 29.26% was DVD (Tables 1—5).

Discussion

The present study demonstrates that a single bolus infusion only of GP IIb/IIIa strategy in PCI has an effective anti-ischemic effect with reduced bleeding complications. The incidence of MACE during coronary stenting has been reduced by the use of GP IIB/IIIa inhibitors in many clinical trials [10]. The scientific basis of using high dose single vial bolus is mentioned below:

1. Single bolus high dose GP IIb/IIIa inhibition has been shown to be very potent inhibitor of platelet aggregation [11].
2. This potent anti-platelet activity of eptifibatide is expected to last for 2—3 h due to its pharmacokinetic properties [11].
3. In most centers, elective stenting procedure last <1 h average (operators manipulate coronary arteries which involves plaque rupture by balloon inflation for a much shorter period in most cases.

Table 1 Baseline characteristics of patients ($N = 85$).

Variables	Eptifibatide used ($n = 44$)	Eptifibatide not used ($n = 41$)	p Value
Age	52.34 ± 8.90	49.68 ± 8.87	0.172
Systolic blood pressure	136.93 ± 21.19	138.41 ± 19.69	0.739
Diastolic blood pressure	84.66 ± 9.30	84.51 ± 8.42	0.939
Total cholesterol	215.75 ± 43.20	224.58 ± 54.92	0.415
S. triglyceride	181.22 ± 63.87	171.60 ± 50.53	0.441
S. high density lipoprotein	35.06 ± 5.44	37.87 ± 5.18	0.653
S. low density lipoprotein	122.52 ± 32.37	125.65 ± 31.71	0.017

All the data expressed in mean ± standard deviation. p Value $\geqslant 0.05$ considered significant.

Table 2 Baseline characteristics and risk factors of both group of patients.

Variables	Eptifibatide used $n = 44$ (%)	Eptifibatide not used $n = 41$ (%)	p Value
Myocardial infarction	17 (38.63)	15 (36.58)	0.512
Unstable angina	4 (9.09)	5 (12.19)	0.454
Stable angina	23 (52.27)	21 (51.21)	
Hypertension	24 (54.54)	21 (51.21)	0.464
Diabetes Mellitus	18 (40.90)	11 (26.82)	0.127
Dyslipidemia	28 (63.63)	25 (60.97)	0.488

Table 3 Vessel involvement and types of lesion of both groups before PCI.

Variables	Eptifibatide used ($n = 44$)	Eptifibatide not used ($n = 41$)	p Value
SVD	25 (56.81)	26 (63.41)	0.345
DVD	16 (36.36)	12 (29.26)	0.322
TVD	3 (6.81)	3 (6.81)	0.628
Lesion characteristics			
Type-A	35 (79.54)	38 (92.68)	0.075
Type-B	9 (20.45)	3 (7.31)	0.075
Type-C	0 (0)	1 (2.27)	0.482

SVD, single vessel disease; DVD, double vessel disease; TVD, triple vessel disease.

Table 4 Types of intra-coronary stents used in both groups.

Variables	Eptifibatide used ($n = 44$)	Eptifibatide not used ($n = 41$)	p Value
BMS	42 (95.45)	38 (92.68)	0.466
DES	2 (4.54)	3 (7.31)	0.466

BMS, bare metal stent; DSE, drug eluting stent.
In short term (one month) outcome, Group I patients had statistically significant less complications in comparison to Group-II patient ($p = 0.017$). In Group-I only 2.27% had Q wave MI AND 2.27% had minor bleeding complication, whereas in Group-II patients 9.76% had Q wave MI, 7.32% had Non-Q MI and 4.88% needed target vessel revascularization again.

Table 5 Short term (one month) adverse events ($N = 85$).

Adverse events	Eptifibatide used ($n = 44$)	Eptifibatide not used ($n = 41$)	p Value
QMI	1 (2.27%)	4 (9.76%)	0.017
NQMI	0 (0%)	3 (7.32%)	
Bleeding	1 (2.27%)	0 (0%)	0.33
TVR	0 (0%)	2 (4.88%)	

All data are expressed as number and percent. QMI, Q wave myocardial infarction; NQMI, Non-Q wave myocardial infarction; TVR, target vessel revascularization.

4. High pressure stent deployment combined with clopidogrel causes very few abrupt closure or acute thrombosis following PCI and prior to hospital discharge.
5. Post-procedural bleeding complications are reduced by avoidance of prolonged GP IIb/IIIa infusion.

Conclusion

As the study excluded patients with MI with in 24 h, saphenous graft stenosis, patients requiring rotational atherectomy or brachytherapy, the low MACE rate may not be applicable to these high risk cohorts, as such further studies are warranted.

In conclusion, IV single bolus dose (15 mg) eptifibatide is safe, clinically effective and highly cost-effective in comparison to conventional regimens of IV bolus plus IV infusion of GP IIb/IIIa inhibitors for patients undergoing elective PCI for developing countries like Bangladesh.

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