The study is limited by its small sample size, its location in only tertiary care hospitals, and limited geographic representation. Further improvements in management and potential clinical outcomes are yet to be shown with long-term follow-up at the HFC

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Improving Outcomes in STEMI PCI

Written by Maria Vinall

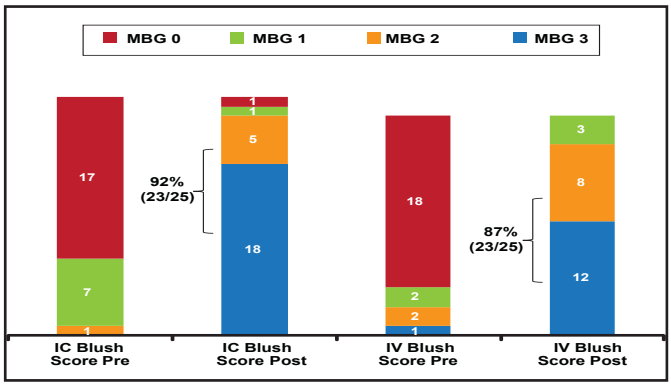
Rapid myocardial reperfusion is the primary goal in patients with ST-segment elevation myocardial infarction (STEMI), and the extent to which early reperfusion is achieved is the main factor in determining the extent of the early and long-term clinical benefit of treatment. Rajesh M. Dave, MD, Ortenzio Heart Center, Harrisburg, Pennsylvania, USA, reviewed several approaches to improving outcomes in these patients.

Two methods for achieving reperfusion include percutaneous coronary intervention (PCI) and fibrinolysis. The success of PCI is frequently assessed in terms of ST-segment elevation resolution or return to normal angiographic TIMI (TIMI 3) flow. Dr. Dave suggested that these two measures may not go far enough. He cited myocardial blush grade (MBG), an angiographic measure of myocardial perfusion, which has been shown to be independently associated with mortality [Svilaas T et al. *New Engl J Med* 2008; Kampinga MA et al. *Circ Cardiovasc Interv* 2010], and suggested that MBG should be documented in addition to TIMI flow as a measure of PCI success.

Catheter-based thrombectomy is a newer modality that may improve reperfusion and outcomes in STEMI patients who are treated with urgent PCI. In a pooled analysis of data from more than 2500 patients in 11 clinical trials, Burzotta and colleagues showed that thrombectomy (in particular, manual thrombectomy) significantly improves the clinical outcome in patients with STEMI who are undergoing mechanical reperfusion and that its effect may be enhanced with the addition of potent antiplatelet therapy (eg, GP IIb/IIIa inhibitors) [Burzotta F et al *Eur Heart J* 2009].

Dr. Dave discussed the results of CRYSTAL AMI, a single-center, prospective, randomized, proof-of-concept study of intravenous (IV) abciximab versus intracoronary (IC) abciximab in patients with acute myocardial infarction who were undergoing PCI within 6 hours of symptom onset. All patients received heparin and a 600-mg clopidogrel load. The use of thrombectomy devices was permitted. MBG, TIMI flow, and ST resolution were evaluated at the end of the procedure, and left ventricular function was evaluated by echocardiography at discharge. Echocardiography was repeated at 30 days, at which time patients also underwent a resting Sestamibi scan. In the IC group 92% of patients achieved the primary endpoint of postprocedure MBG >2 versus 86% of patients who received IV therapy (Figure 1). TIMI flow was also higher among patients who received IC therapy (96%) versus those who received IV therapy (82%). There were no readmissions or deaths in the IC arm versus 2 readmissions and 1 death among patients who received IV therapy. There were no major bleeds in either group.

Figure 1. MGB Score.



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"Improving myocardial preservation in patients presenting with STEMI has profound economic impact through reduced cost of care, improved quality of life, and less need for ICD implantation." This approach is being further evaluated in the INFUSE-AMI study, a randomized, multicenter, single-blind evaluation of IC abciximab infusion and aspiration thrombectomy in patients who are undergoing PCI for anterior STEMI that is currently recruiting [Gibson CM et al. *Am Heart J* 2011; NCT00976521].

A Comparison of the Safety and Efficacy of BMS and DES for On- and Off-Label Indications: A One-Year Study

Written by Maria Vinall

The effectiveness of drug-eluting stents (DES) in reducing rates of restenosis has led many clinicians to extend their use to patients with clinical and anatomical features that are beyond those that are approved by the United States Food and Drug Administration (FDA). However, the FDA has questioned the safety and effectiveness of this off-label use, citing a potentially increased risk of stent

thrombosis and death or myocardial infarction (MI). Mohamad Ahmad Mosaad, MD, Al-Azhar University, Cairo, Egypt, presented data from a nonrandomized study that compared intermediate- and mid-term clinical outcomes between bare-metal stents (BMS) and DES that were used for either on- or off-label indications. The investigators concluded that DES, whether applied in on- or off-label situations, were safe and effective with a low incidence of stent thrombosis when compared with BMS.

The study comprised 102 patients who were admitted to two hospitals in Egypt between April 2008 and August 2010 with on- and off-label coronary artery lesions but without acute ST elevation myocardial infarction (STEMI). On-label use included treatment of lesions in native coronary arteries that were 30 mm or less in length with a reference vessel diameter of 2.5 to 3.5 mm for the Cypher stent and 28 mm or less in length with a reference vessel diameter of 2.5 to 3.75 mm for the Taxus stent. Patients who were included in the off-label group had restenotic lesions; lesions in a bypass graft; left main coronary artery disease; ostial, bifurcated, or totally occluded lesions; or a reference vessel <2.5 mm or >3.75 mm or a lesion length of >30 mm. Subjects were stratified into four groups (DES on-label, DES off-label, BMS on-label, BMS off-label), each with an approximately equal number of patients. The choice of balloon type and stent was left to the discretion of the operator. Angiograms of the coronary artery were obtained before percutaneous coronary intervention (PCI), after PCI, and at angiographic follow-up 1 year later. Major adverse cardiac events (death, MI, target lesion revascularization, and target vessel revascularization) were assessed at 12 months. Dual antiplatelet therapy with aspirin and an ADP receptor blocker were recommended for 12 months in all patients. Patients were also assessed clinically and for medication compliance at 12 months.

The incidence of in-stent restenosis (ISR) at 12 months with DES was 4% in the on-label group and 8% in the off-label group (p>0.05; compared with 29.2% and 31%, respectively, with BMS (p>0.05). In-stent thrombosis occurred in only 1 patient in each off-label group. Predictors of ISR in the BMS group were more complex lesions (p=0.046), longer mean lesion length (p=0.044), and hypertension (p=0.044). Left ventricular ejection fraction was significantly higher in the DES group (62.4%) versus the BMS group (57.7%; p<0.04). Stent diameter and length, inflation pressure, and lesion characteristics in the off-label and on-label BMS and DES groups were not significantly different.

The authors conclude that although they are not approved by the United States FDA or recommended by current guidelines, DES may be safe for some off-label indications in carefully selected patients. As these preliminary data are nonrandomized and modestly powered, the investigators recommended that this question be studied in a larger, randomized, multicenter trial of longer duration.

IC Eptifibatide Compared with IC Tirofiban In Patients With Acute Anterior STEMI Undergoing Primary PCI

Written by Phil Vinall

In patients with anterior ST segment elevation myocardial infarction (STEMI) who are treated by primary percutaneous coronary intervention (PCI), adjunct treatment with intracoronary (IC) eptifibatide did not improve the primary endpoint of post-PCI epicardial flow compared with IC tirofiban. There was, however, improvement in some secondary endpoints with IC eptifibatide including better myocardial reperfusion, reduction of in-hospital recurrent ischemia, greater ST segment resolution, and more preservation of systolic function with less TIMI minor bleeding compared with IC tirofiban.

When given systemically, platelet glycoprotein IIb/IIIa inhibitors enhance the benefits of primary PCI by improving microcirculation and tissue perfusion and reducing major adverse cardiac events (MACE) [Montalescot G et al. *N Engl J Med* 2001; Zeymer U. *Expert Opin Pharmacother* 2007; van't Hof AW & Valgimigli M. *Drugs* 2009]. Their use in selected patients is supported in the ACC/AHA 2009 STEMI/PCI Guideline Focused Update [*J Am Coll Cardiol* 2009] and the ESC/EACTS Guidelines on Myocardial Revascularization [*Eur Heart J* 2010].

IC GP IIb/IIIa inhibitors result in high local drug concentrations and may be more effective than a standard intravenous (IV) bolus in the dissolution of thrombi and micro emboli and thus may lead to improved myocardial microcirculation and reduced no reflow and infarct size with a possible decrease in adverse systemic effects (bleeding, thrombocytopenia) [Srinivasan M & Prasad A. *J Invasive Cardiol* 2009].

In the study presented by Tamer Abu Arab, MD, Ain Shams University, Cairo, Egypt, 60 patients (mean age 55 years; mostly men) with anterior STEMI undergoing primary PCI were randomized to either two IC boluses of eptifibatide (180 mcg/kg each) just after passage of the wire or first balloon inflation followed by continuous infusion of