Table 2. Relationship Between Change in DAPT Status and Death

	No. of Eligible Participants	No. of Changes in Medication	No. of Events (%)	Event Rate per 100 Person-Years at Risk
During time on DAPT	8593	—	517 (85)	4.6
After DAPT change (any time)	3608	4041	92 (15)	2.7
< 7 d after stop	3608	4041	3	3.9
7 to 30 d after stop	3580	4004	6	2.4
> 30 d after stop	3467	3865	83	2.7

DAPT, dual-antiplatelet therapy.

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Mixed Results With iNO During PCI

Written by Mary Beth Nierengarten

Inhaled nitric oxide (iNO) delivered to patients before and during percutaneous coronary intervention (PCI) for treatment of myocardial infarction (MI) does not reduce infarct size but may enhance functional recovery in patients who also receive intracoronary or intravenous nitroglycerin (NTG).

Stefan P. Janssens, MD, University Hospital Gasthuisberg of Leuven, Leuven, Belgium, presented results of the Effects of Nitric Oxide for Inhalation in Myocardial Infarction Size trial [NCT01398384]—a double-blind, placebo-controlled, parallel-group study to test the hypothesis that iNO reduces infarct size and adverse left ventricular (LV) remodeling and improves LV functional recovery in patients with STEMI who have undergone PCI. The phase 2 multicenter study included 248 patients with STEMI who presented between 2 and 12 hours after symptom onset and were randomized to a group that received supplemental oxygen with iNO at a concentration of 80 parts per million (n = 126) or to a control group of no iNO (n = 122).

All patients included in the study were older than 18 years, with no congestive heart failure and with normal oxygen saturation. Patients were excluded from the study if they had a prior MI, coronary artery bypass grafting, prior PCI, left bundle branch block, contraindication to cardiac magnetic resonance, active or recent hemorrhage, or pulmonary disease needing oxygen.

The primary end point of the study was infarct size (percentage LV mass) at 48 to 72 hours after PCI, as assessed by cardiac magnetic resonance imaging. There was no difference in the relative infarct size between patients treated with iNO and the control group (18.0% vs 19.4%; $P = .44$).

In a prespecified subgroup analysis of patients who also received NTG during PCI, NTG-naïve patients who received iNO had a significant reduction in infarct size as compared with controls (17.0% vs 22.4%; $P = .044$). However, in patients who had previously received NTG, infarct size increased during PCI when compared with that of controls (19.3% vs 15.1%; $P = .059$). Secondary end points of the study included cardiovascular magnetic resonance–based outcomes, including infarct size as percentage area at risk at 48 to 72 hours, incidence of myocardial hemorrhage at 48 to 72 hours, global LV function at 48 to 72 hours and at 4 months, and changes in remodeling at 4 months.

A trend toward greater myocardial salvage index and enhanced functional recovery was found in patients who received iNO. Furthermore, at 4 months, the early benefit of this trend toward functional recovery was enhanced, as was adverse LV remodeling. An additional secondary end point examining a clinical composite outcome of death, recurrent MI or ischemia requiring rehospitalization or revascularization, and stroke also showed a promising trend in the benefit of iNO.

Prof Janssens concluded his presentation by emphasizing that the preliminary results of this trial need independent corroboration in future studies.

Early Ticagrelor Improves ST Segment Resolution After PCI

Written by Mary Beth Nierengarten

For patients with ongoing STEMI, prehospital administration of ticagrelor approximately 45 to 60 minutes prior to undergoing percutaneous coronary intervention (PCI) improves ST elevation segment resolution after PCI without increasing bleeding.

Arnoud W. J. van't Hof, MD, Isala Klinieken, Zwolle, The Netherlands, presented the results of a secondary prespecified substudy analysis of the Administration of Ticagrelor in the Cath Lab or in the Ambulance for New ST Elevation Myocardial Infarction to Open the Coronary Artery [ATLANTIC; NCT01347580], an international multicenter double-blind study to assess whether prehospital administration of the direct-acting platelet P2Y12 receptor antagonist ticagrelor can improve coronary reperfusion and clinical outcomes in patients with STEMI.

ATLANTIC randomized 1862 patients with STEMI who were <6 hours from symptom onset to 1 of 2 ticagrelor administration groups: prehospital (in the ambulance; n=909) or in hospital (in the catheterization laboratory; n=953) [Montalescot G et al. *N Engl J Med*. 2014]. The average age of the patients was 61 years; approximately 19% had a body mass index of ≥30 kg/m^2; nearly 13% had diabetes; and most were men (about 80% in each treatment group).

The prespecified substudy, called PRIVATE-ATLANTIC, focused on the effect of early ticagrelor administration on ST elevation resolution after PCI in this same cohort of patients. PRIVATE-ATLANTIC found a trend toward ST segment resolution in patients in the prehospital group as compared with the in-hospital group (42.5% vs 47.5%; $P=.055$). However, significantly more patients in the prehospital group had a degree of ST segment elevation resolution as compared with the in-hospital group (median, 75.0% vs 71.4%; $P=.049$).

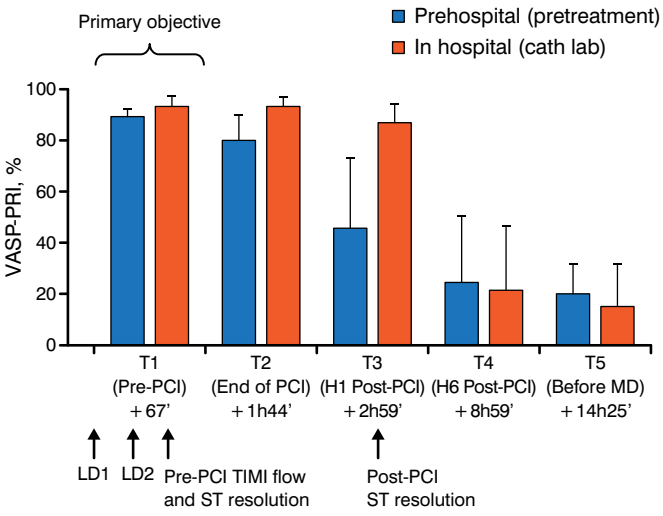
Regarding the effect of early ticagrelor on platelet aggregation inhibition, there was no significant difference between the prehospital and in-hospital groups before and after PCI (Figure 1). Prof van't Hof emphasized that most of platelet inhibition from ticagrelor is seen after PCI.

The study also showed the importance of complete ST segment elevation resolution on major adverse cardiac events (MACEs). The incidence of MACEs and all-cause death up to 30 days after PCI was higher in patients with incomplete resolution vs those with complete resolution (5.9% vs 2.0% and 2.6% vs 1.1%, respectively). In addition, more patients with incomplete resolution had definite stent thrombosis up to 30 days after PCI as compared with patients with complete resolution (1.4% vs 0.3%).

The impact of complete vs incomplete ST segment elevation resolution after PCI on 30-day clinical end points is shown in Table 1, including a significant increase in the odds of all-cause death in patients with incomplete ST segment elevation resolution.

According to Prof van't Hof, this supports the validity of using complete ST-segment elevation resolution as a surrogate marker for CV clinical outcomes in patients with STEMI.

Figure 1. Effect of Ticagrelor on Platelet Inhibition



All comparisons (prehospital vs in-hospital), nonsignificant.

Cath lab, catheter laboratory; H/h, hour; LD, loading dose; MD, maintenance dose; PCI, percutaneous coronary intervention; T, time; VASP-PRI, vasodilator-stimulated phosphoprotein–platelet reactivity index.

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Table 1. Effect of ST Segment Elevation Resolution After PCI on Clinical Outcomes

Outcome	ST Resolution After PCI, No. (%)		OR (95% CI)	*P* Value
	Complete (n=800)	Incomplete (n=656)		
Death (all cause)	9 (1.1)	17 (2.6)	0.43 (0.19 to 0.97)	.041
Myocardial infarction	6 (0.8)	9 (1.4)	0.54 (0.19 to 1.53)	.249
Stroke	1 (0.1)	2 (0.3)	0.41 (0.04 to 4.52)	.466
Transient ischemic attack	0	1 (0.2)		
Urgent coronary revascularization	2 (0.3)	10 (1.5)	0.16 (0.04 to 0.74)	.019

PCI, percutaneous coronary intervention.

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