Coverage of ACC 2004

The 53rd Annual Scientific Session of the American College of Cardiology (ACC) was held in New Orleans, Louisiana, March 7-10, 2004.

EMBOLIC PROTECTION IN AMI

The active world of distal protection took a hit with the presentation of the EMERALD trial results, which revealed that although a balloon-occlusion distal protection device is safe and effective in removing debris liberated during primary percutaneous coronary intervention (PCI) for AMI, it does not improve microvascular flow or function, event-free survival, or the incidence of complete ST-segment resolution, nor does it reduce infarct size.

The multicenter trial randomly assigned 501 ST-elevation AMI patients to primary PCI with the Medtronic (Santa Rosa, CA) .028-inch GuardWire Plus Temporary Occlusion and Aspiration System or PCI with no embolic protection. Researchers were able to cross the GuardWire over the lesion in 96% of patients; balloon occlusion was accomplished in 95% of these and visible debris was collected in 73%.

The primary study endpoint, ST-segment resolution at 30 minutes, was observed in 62.2% of the GuardWire group and in 60.6% of those who underwent PCI without distal protection. Infarct size measured by Tc-99m-SPECT, the other primary study endpoint, was reduced in 17.1% of the study group and in 14.3% of controls. Final myocardial blush results showed that grade 3 was achieved in 60.1% and 52.7%, respectively. Major adverse coronary events (MACE), defined as death, re-MI, ischemic target vessel revascularization, or disabling stroke, occurred in 5.8% of the embolic protection group and in 7.4% of controls. None of these differences were statistically meaningful.

SYNERGY: ENOXAPARIN VERSUS HEPARIN

The low-molecular-weight heparin enoxaparin (Lovenox, Aventis, Bridgewater, NJ) proved to be at least as effective but not superior to unfractionated heparin in high-risk non-ST-elevation MI patients undergoing early invasive treatment, according to primary results of the SYNERGY trial. There was evidence, however, that enoxaparin causes more bleeding complications compared to heparin.

The SYNERGY trial randomly assigned 10,027 high-risk ACS patients to enoxaparin (1 mg/kg subcutaneous every 12 hours) or unfractionated heparin (60 U/kg bolus, then 12 U/kg/hour adjusted to achieve an aPTT of 50 to 70 seconds) followed by an early invasive strategy and other medical therapy as indicated by AHA/ACC guidelines.

TABLE 1. MAJOR CLINICAL 30-DAY ENDPOINTS

	Enoxaparin	UFH	*P* Value
Death (%)	3.2	3.1	.705
MI (%)	11.7	12.7	.135
Death/MI (%)	14.0	14.5	.396

There were no significant differences in rates of death, MI, or the combined primary endpoint of death or MI at 30 days between enoxaparin- and heparin-treated patients.

While GUSTO severe bleeding (bleeding leading to hemodynamic compromise or intracranial hemorrhage) was not significantly different between the two groups, TIMI major bleeding occurred significantly more often in the enoxaparin group (9.1% vs 7.6%). Similarly, significant hemoglobin and hematocrit drop was more common in the enoxaparin group (15.2% vs 12.5%).

Allaying concerns that enoxaparin may not be an effective enough anticoagulant in the PCI setting, there were no differences between groups in the incidence of unsuccessful PCI, threatened abrupt closure, abrupt closure, or emergency CABG.

PERCUTANEOUS MITRAL VALVE REPAIR

Adding to a growing body of literature supporting percutaneous methods to repair and replace heart valves, the EVEREST trial presented at ACC established the safety and feasibility of a percutaneous adaptation of an established surgical technique for mitral valve repair. The technique involves placing a stitch in the middle of the two leaflets of the mitral valve—or in its percutaneous iteration, a clip—forcing them into better alignment, effectively creating a "tissue bridge."

The Evalve (Redwood City, CA) clip is delivered to the target anatomy via a transeptal puncture into the left atrium under transesophageal (TEE) guidance. The clip can be removed completely or repositioned if initial deployment is inadequate, and the technique does not preclude future surgical intervention.

Ten (of a planned 20) patients with moderately severe or severe mitral regurgitation have undergone the procedure. Nine of 10 had a reduction in mitral regurgitation after the procedure. In seven patients, mitral regurgitation was reduced to ≤ 2+. The device was successfully deployed in all 10 patients with edge-to-edge coaptation achieved. There

were no deaths, strokes, or embolizations in the periprocedural period. There was incomplete coaptation at follow-up in two patients and in a third patient the clip became detached. All three "failures" subsequently underwent successful surgical mitral valve repair.

DRUG-ELUTING STENT TRIALS

SES-SMART was a randomized trial comparing a sirolimus-eluting stent (SES) versus an uncoated stent in 257 non-ST elevation ACS patients with coronary arteries less than 2.75 mm in diameter (72% were male). By 8 months, clinical restenosis was markedly reduced in the SES group at 9.8% compared to 53.1% in the bare metal stent group. Late loss was 0.16 mm versus 0.69 mm, respectively. Major adverse cardiac or cerebrovascular events (MACCE) occurred in 9.3% of the SES group versus 31.3% of the bare metal stent group. The advantages seen with SES were present across multiple subgroups and confirm results seen in prior studies.

The DIRECT trial evaluated in a nonrandomized manner the benefits of direct Cypher (Cordis Corporation, a Johnson & Johnson company, Miami, FL) stenting without predilatation to standard Cypher stent placement data gathered from historical controls. At 8 months, there were no differences between groups in terms of late loss (0.21 mm vs 0.24 mm) or the incidence of major adverse cardiac or cerebrovascular events (20% vs 17.7%).

Three-year data from the RAVEL study confirm the safety and efficacy of the Cypher stent. MACE- (death, MI, CABG, re-PTCA) free survival at 3 years was 85% in the sirolimus-eluting stent arm versus 77.1% in the bare metal stent arm. There were 7 deaths in the sirolimus arm between 1 and 3 years—5 of which were from noncardiac causes, and 3 additional deaths in the control arm, 2 from noncardiac causes. Interesting to note, there were 4 late target lesion revascularizations in the sirolimus arm compared to none in the control arm. This difference was not significant, however, due to the small sample size.

HYPEROXEMIC BLOOD INFUSION DURING PCI DOES NOT IMPROVE MYOCARDIAL SALVAGE

Delivering super-saturated aqueous oxygen at the time of reperfusion therapy did not result in improved creatinine kinase (CK) levels or a greater incidence of complete ST-segment resolution in AMI patients, according to preliminary, 30-day data from the AMIHOT study presented during a late breaking clinical trials session.

The trial randomized 250 patients to either standard normoxemic PCI or 90-minutes of hyperoxemic intracoronary blood infusion immediately after PCI.

The TherOx AO System (TherOx Inc, Irvine, CA) combines physiologic saline with 100% O_2 to create sterile aqueous oxygen (AO), which is then mixed with autologous blood from an arterial puncture and returned to the circulation via a proprietary delivery catheter advanced through conventional means to the infarct-related artery.

There were no significant differences in creatinine kinase (CK) levels out to 24 hours. Also, no significant difference was noted in terms of ST-segment resolution. Not surprisingly, patients with anterior MIs had larger enzyme increases and more ST-segment elevation at baseline. Among this group there was a nonsignificant trend toward better ST-segment resolution with hyperoxemic therapy compared to PCI alone (P=.09). Further analyses are ongoing. ■