Research Highlights

Highlights from the latest articles in interventional cardiology

High-dose statin pretreatment prevents contrast-induced nephropathy in patients undergoing percutaneous coronary intervention

Evaluation of: Patti G, Ricottini E, Nusca A *et al.* Short-term, high-dose atorvastatin pretreatment to prevent contrast-induced nephropathy in patients with acute coronary syndromes undergoing percutaneous coronary intervention (from the ARMYDA-CIN [Atorvastatin for Reduction of Myocardial Damage during Angioplasty–Contrast-Induced Nephropathy] Trial. *Am. J. Cardiol.* 108(1), 1–71 (2011).

Patti *et al.* performed a randomized, multicenter, prospective, double-blind clinical trial to investigate whether short-term high-dose atorvastatin load decreases the incidence of contrast-induced nephropathy (CIN) after percutaneous coronary intervention (PCI). The trial involved 241 statin-naive patients who randomly received 80 mg atorvastatin (n = 120) or placebo (n = 121) 12 h before PCI, with another 40 mg atorvastatin or placebo given immediately before the procedure. All of the patients received long-term atorvastatin therapy (40 mg/day) after the intervention.

The primary end point was the incidence of CIN, defined as an increase in serum creatinine of at least 0.5 mg/dl or more than 25% from baseline. The investigators found that 5% of the patients in the atorvastatin group developed CIN versus 13.2% in the placebo group (p = 0.046). In addition, they found out that in the subgroup without baseline chronic renal failure, the incidence of CIN was lower in the atorvastatin group (1%) versus the control group (7%), whereas in patients with chronic renal failure it was 14 versus 26%. Furthermore, there was also a significant impact on the length of stay after intervention, which was shorter in patients randomized to atorvastatin (2.9 days) versus the control group (3.2 days). Patients who developed CIN had a longer stay (3.5 days) compared with those without (2.9 days). These data suggest that the early use of high-dose statins as adjuvant pharmacologic therapy prevent CIN and shortens hospital stay in patients with acute coronary syndrome undergoing PCI.

High-dose statin pretreatment benefits patients undergoing percutaneous coronary intervention

Evaluation of: Patti G, Cannon CP, Murphy SA *et al.* Clinical benefit of statin pretreatment in patients undergoing percutaneous coronary intervention: a collaborative patient-level meta-analysis of 13 randomized studies. *Circulation* 123, 1622–1632 (2011).

Recent studies indicate that statin pretreatment decreases periprocedural complications and major adverse cardiac events (MACE) in patients undergoing percutaneous coronary intervention (PCI). Patti *et al.* performed a collaborative meta-analysis including 13 clinical trials with a total of 3341 patients, of whom 1692 were randomized to high-dose

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statin and 1649 to low-dose or no statin therapy before PCI. In all studies, all of the patients received statin therapy after the intervention. They evaluated the rate of periprocedural myocardial infarction (PMI), which is defined as an increase in postintervention creatine kinase-MB ≥three times the upper limit of normal and MACE after 30 days including death, myocardial infarction and target-vessel revascularization. The rate of PMI and MACE after 1 month were significantly lower in the high-dose statin group (7 and 7.4%) versus the control group (11.9 and 12.6%). The advantage was maintained across various subgroups (age ≤ or ≥65, gender, diabetes, acute coronary syndrome, single or multivessel PCI or patients receiving glycoprotein IIb/IIIa inhibitors or not). The benefit appeared greater in the subgroup with elevated baseline C-reactive protein levels (n = 734 patients) with an incidence of PMI in 4.3% in the high-dose statin group versus 12.3% in the control group (68% decrease of the relative risk reduction). These data suggest that all patients who are candidates for PCI should be considered for an early initiation of high-dose statins.

Percutaneous septal ablation is safe in the treatment of hypertrophic obstructive cardiomyopathy

Evaluation of: Jensen MK, Almaas VMA, Jacobsson L *et al.* Long-term outcome of percutaneous transluminal septal myocardial ablation in hypertrophic obstructive cardiomyopathy: a Scandinavian multicenter study. *Circ. Cardiovasc. Interv.* 4(3), 256–265 (2011).

Up to two thirds of patients with hypertrophic cardiomyopathy have an obstruction of the left ventricular outflow tract, which is then defined as a hypertrophic obstructive cardiomyopathy (HOCM), which is associated with increased morbidity and mortality. Owing to solid long-term results, myectomy has been the gold standard for septal reduction therapy. Jensen *et al.* performed a multicenter trial in four Scandinavian centers and they included all patients with HOCM who were treated with percutaneous transluminal septal myocardial ablation (PTSMA) from 1999 to 2010. In 279 patients, a total of 313 PTSMA procedures were performed. The left ventricular outflow tract gradient at rest and during Valsalva maneuver was reduced from a median of 58 mmHg (34–89 mmHg) and 93 mmHg (70–140 mmHg) at baseline to a median of 12 mmHg (8–24 mmHg) and 21 mmHg (11–42 mmHg) at 1-year follow-up. The proportion of patients with syncope (18%) and New York Hearth Association class III/IV (94%) was reduced to 2 and 21%, respectively. The study shows that all treatment effects remained stable during long-term follow-up. The in-hospital mortality was 0.3%, and the 1-, 5- and 10-year survival rates were 97, 87 and 67%, respectively, comparable to that in an age- and sex-matched background population. These data show that PTSMA is a safe, effective and enduring treatment of HOCM and may become the treatment of choice in the near future.

Troponin elevation after percutaneous coronary intervention indicates higher mortality risk

Evaluation of: Feldman DN, Kim L, Rene AG *et al.* Prognostic value of cardiac troponin-I or troponin-T elevation following nonemergent percutaneous coronary intervention: a meta-analysis. *Catheter Cardiovasc. Interv.* 77(7) 1020–1030 (2011).

The prognostic value of troponin rise after percutaneous coronary intervention (PCI) has been the subject of controversy for many years. Feldman *et al.* performed a meta-analysis including 22 trials with a total of 22,353 patients, reporting the predictive value of cardiac troponin-T (cTnT) and troponin-I (cTnI) after nonemergent PCI. The trials were published between 1998 and 2009 with a follow-up period between 3 to 67 months. The postprocedural cTnT was increased in 25.9% of patients and cTnI in 34.3% of patients. The results showed that the long-term all-cause mortality in patients with elevated troponin after PCI (5.8%) was significantly higher when compared with patients without troponin rise (4.4%). Furthermore, they found that the combination of all-cause mortality and myocardial infarction was also higher in the group with elevated troponin (9.2%) versus the group without rise in troponin (5.3%). These data indicate that troponin rise after elective PCI is indicative of an increase in long-term all-cause mortality as well the combination of all-cause mortality and myocardial infarction. These results may show that the measurement of postprocedural troponin can identify higher-risk patients who need to be monitored closely and treated aggressively.