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EXPEDITED PUBLICATIONS

Efficacy of Atorvastatin Reload in Patients on Chronic Statin Therapy Undergoing Percutaneous Coronary Intervention

Results of the ARMYDA-RECAPTURE (Atorvastatin for Reduction of Myocardial Damage During Angioplasty) Randomized Trial

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Objectives This study was designed to investigate whether an acute atorvastatin reload before percutaneous coronary intervention (PCI) protects patients receiving chronic statin therapy from periprocedural myocardial damage.

Background Previous ARMYDA (Atorvastatin for Reduction of Myocardial Damage During Angioplasty) studies demonstrated that short-term pre-treatment with atorvastatin reduces myocardial infarction during PCI in statin-naïve patients with both stable angina and acute coronary syndromes.

Methods A total of 383 patients (age 66 ± 10 years, 305 men) with stable angina (53%) or non–ST-segment elevation acute coronary syndromes (47%) and chronic statin therapy (55% atorvastatin) undergoing PCI were randomized to atorvastatin reload (80 mg 12 h before intervention, with a further 40-mg pre-procedural dose [n = 192]) or placebo (n = 191). All patients received long-term atorvastatin treatment thereafter (40 mg/day). The primary end point was 30-day incidence of major adverse cardiac events (cardiac death, myocardial infarction, or unplanned revascularization).

Results The primary end point occurred in 3.7% of patients treated with atorvastatin reload and in 9.4% in the placebo arm (p = 0.037); this difference was mostly driven by reduction in periprocedural myocardial infarction. There was lower incidence of post-procedural creatine kinase-myocardial band and troponin-I elevation greater than the upper limit of normal in the atorvastatin arm (13% vs. 24%, p = 0.017 and 37% vs. 49%, p = 0.021, respectively). Multivariable analysis identified atorvastatin reload as a predictor of decreased risk of 30-day incidence of major adverse cardiac events (odds ratio: 0.50, 95% confidence interval: 0.20 to 0.80; p = 0.039), mainly in patients with acute coronary syndromes (82% relative risk reduction; p = 0.027).

Conclusions The ARMYDA-RECAPTURE study suggests that reloading with high-dose atorvastatin improves the clinical outcome of patients on chronic statin therapy undergoing PCI. These findings may support a strategy of routine reload with high-dose atorvastatin early before intervention even in the background of chronic therapy. (J Am Coll Cardiol 2009;54:000–000) © 2009 by the American College of Cardiology Foundation

In the context of the current applications of statin therapy in a variety of clinical syndromes (1–5), the ARMYDA (Atorvastatin for Reduction of Myocardial Damage During Angioplasty) trial (6) demonstrated a significant reduction of periprocedural myocardial infarction (MI) after a short-term pre-treatment with atorvastatin in statin-naïve patients with chronic stable angina undergoing percutaneous coronary intervention (PCI). This myocardial protection was confirmed by the ARMYDA-ACS (Atorvastatin for Reduction of Myocardial Damage During Angioplasty–Acute Coronary Syndromes) trial (7), in which a pre-treatment strategy of high-dose atorvastatin given 12 h pre-PCI in statin-naïve patients with acute coronary syndromes (ACS) reduced 30-day incidence of cardiac events. However, given the large proportion of patients undergoing PCI while on chronic statin therapy, it is unclear whether an acute statin

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Abbreviations and Acronyms

ACS = acute coronary syndrome

CK-MB = creatine kinase-myocardial band

CRP = C-reactive protein

MACE = major adverse cardiac events

MI = myocardial infarction

PCI = percutaneous coronary intervention

ULN = upper limit of normal

reload before intervention in such patients would have similar cardioprotective effects. Thus, the ARMYDA-RECAPTURE trial was designed to test the hypothesis whether an acute atorvastatin treatment on top of chronic statin use would translate into improved clinical outcome in patients undergoing PCI.

Methods

Study population and design. The ARMYDA-RECAPTURE study is a multicenter, randomized, prospective, double-blind clinical trial performed in 4 Italian institutions (Campus Bio-Medico University of Rome, Vito Fazzi Hospital of Lecce, Sant'Eugenio Hospital of Rome, and San Filippo Neri Hospital of Rome) (Fig. 1). By protocol, only patients on chronic (>30 days) statin therapy were enrolled. Clinical enrollment criteria were: 1) stable angina with inducible myocardial ischemia and indication to coronary angiography; or 2) non–ST-segment elevation ACS requiring early invasive strategy. Exclusion criteria were: ST-segment elevation acute MI, non–ST-segment elevation ACS with high-risk features warranting emergency coronary angiography (<2 h) (8), any increase in liver enzymes (alanine aminotransferase and aspartate aminotransferase); left ventricular ejection fraction <30%, renal failure with creatinine >3 mg/dl, or history of liver or muscle disease. A total of 848 patients fulfilling the inclusion criteria were initially evaluated; 391 patients (46%) met the exclusion criteria: 254 patients (30%) were excluded because they were not on statin therapy, 40 patients were excluded for non–ST-segment elevation ACS requiring emergency intervention, 86 because of severe left ventricular dysfunction, and 11 because of chronic renal failure. Patients' enrollment was irrespective of type and doses of chronic statin therapy. Eligible patients (n = 457) were randomized to receive placebo or atorvastatin (80-mg loading given a mean of 12 h before coronary angiography, with a further 40-mg dose approximately 2 h before the procedure). Patients were assigned to the study arm using an

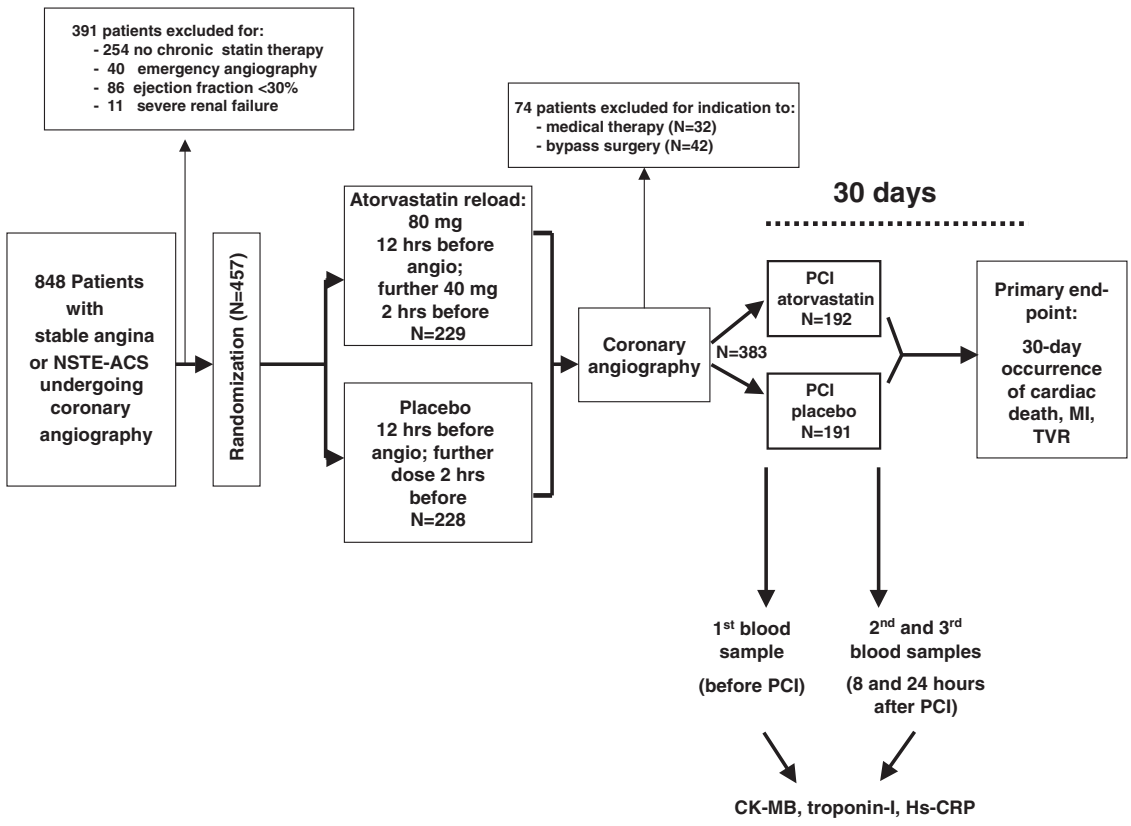

Figure 1 Study Design of the ARMYDA-RECAPTURE Trial

Flow chart shows the design of the ARMYDA-RECAPTURE (Atorvastatin for Reduction of Myocardial Damage During Angioplasty) study. angio = angiography; CK-MB = creatine kinase-myocardial band; Hs-CRP = high-sensitivity C-reactive protein; MI = myocardial infarction; NSTE-ACS = non–ST-segment elevation acute coronary syndrome; PCI = percutaneous coronary intervention; TVR = target vessel revascularization.

electronic spreadsheet indicating the group assignment by random numbers; randomization blocks were created and distributed to the 4 centers. After coronary angiography, 74 patients (37 in each randomization arm) who did not receive angioplasty were excluded from the study (32 were treated medically and 42 with bypass surgery); thus, 383 patients (192 randomized to atorvastatin and 191 to placebo) undergoing PCI immediately after diagnostic angiography were enrolled and represent the study population. Physicians performing the procedure and the follow-up assessment were not aware of the randomization assignment.

All interventions were performed with standard technique, as previously described (6,7). According to protocol, patients were pretreated with aspirin (100 mg/day) and clopidogrel (600-mg loading dose at least 3 h before the procedure) (9). Procedural success was defined as reduction of stenosis to less than 30% residual narrowing. Following PCI, aspirin (100 mg/day) was continued indefinitely, whereas clopidogrel (75 mg/day) was administered for at least 1 month (12 months in patients treated for ACS or receiving drug-eluting stents). All patients after intervention were treated with atorvastatin (40 mg/day), irrespective of the initial randomization assignment.

Blood samples were collected in the study patients before and at 8 and 24 h after PCI to measure creatine kinase-myocardial band (CK-MB) (mass), troponin-I (mass), and myoglobin levels; further measurements were performed in case of post-procedural symptoms suggestive of myocardial ischemia. Levels of CK-MB, troponin-I, and myoglobin were detected using the Access 2 Immunochemiluminometric assay (Beckman Coulter, Fullerton, California) (10). The upper limit of normal (ULN) was defined as the 99th percentile of normal population with a total imprecision of <10%, according to Joint European Society of Cardiology/American College of Cardiology guidelines (11). Normal limits were ≤3.6 ng/ml for CK-MB and ≤0.08 ng/ml for troponin-I. C-reactive protein (CRP) levels were also measured before PCI and at 8 and 24 h after intervention. C-reactive protein was assayed by the KRIPTOR-ultrasensitive immunofluorescent assay (BRAHMS, Hennigsdorf/Berlin, Germany), with detection limit of 0.06 mg/l. One-month clinical follow-up was performed by office visit in all study patients. Each patient gave informed consent to the study. The study was approved by the institutional review boards of the institutions involved. The trial was not supported by any external source of funding.

End points. The primary end point of the ARMYDA-RECAPTURE trial was 30-day incidence of major adverse cardiac events (MACE): cardiac death, MI, target vessel revascularization. Myocardial infarction was defined following the consensus statement of the Joint ESC/ACCF/AHA/WHF Task Force for the Redefinition of Myocardial Infarction for clinical trials on coronary intervention (12), as post-procedural increases of cardiac biomarkers (troponin or CK-MB) greater than 3 times the 99th percentile of ULN in patients with normal baseline levels, and as a subsequent elevation >3 times in CK-MB or troponin in patients with raised baseline levels. Target vessel revascularization included bypass surgery or repeat PCI of the target vessel(s).

Secondary end points of the study were: 1) any post-procedural increase of markers of myocardial injury above ULN (CK-MB and troponin-I); 2) post-procedural variations from baseline of CRP levels in the 2 arms; and 3) MACE incidence in pre-specified clinical subgroups (stable angina vs. ACS), which is consistent with the earlier ARMYDA and ARMYDA-ACS trials (6,7).

Statistics. In the ARMYDA and ARMYDA-ACS trials (6,7), an overall incidence of MACE at 30 days of 18% and 17%, respectively, was observed in the placebo arms of statin-naïve patients, which decreased by 70% with atorvastatin pre-treatment; if we hypothesize a 12% incidence of events in patients on chronic statin treatment and a similar 70% reduction in patients with atorvastatin reload, a total sample size of 306 patients (153 in each group) would provide 80% power to detect difference with an alpha level of 0.05.

Continuous variables between groups were compared by *t* test for normally distributed values; otherwise the Mann-Whitney *U* test was used. Proportions were compared by Fisher exact test when the expected frequency was <5, otherwise the chi-square test (Yates' corrected) was applied. Odds ratios (ORs) and 95% confidence intervals (CIs) assessing the risk of the primary end point in the overall population according to potential confounding variables were assessed by logistic regression. The following parameters were evaluated first in a univariate model: age, sex, center of enrollment, type of chronic statin therapy, use of beta-blockers, angiotensin-converting enzyme inhibitors, glycoprotein IIb/IIIa inhibitors, diabetes, dyslipidemia, systemic hypertension, cigarette smoking, left ventricular ejection fraction, type of lesion (A/B_1 vs. B_2/C), multivessel intervention, stent length, stent diameter, use of direct stenting, duration of balloon inflations, and use of high-pressure post-dilation. Of those, variables with a p value <0.15 were then entered into a multivariable logistic regression analysis. Although this may lead to an overfitted multivariable model, all those variables were entered in order not to miss potential confounders. Multivariable logistic regression model was also used to evaluate the comparison of atorvastatin reload versus placebo with regard to incidence of MACE in pre-specified subsets, defined by clinical pattern on admission (stable angina vs. ACS). Results are expressed as mean ± SD, unless otherwise specified. All calculations were performed by SPSS version 12.0 (SPSS, Inc., Chicago, Illinois), and p values <0.05 (2-tailed) were considered significant.

Results

Study population. Clinical and procedural features in the treatment and placebo arms are reported in Table 1 and

Table 1 Main Demographic/Clinical Features in the Atorvastatin Reload and Placebo Groups

Variable	Atorvastatin (n = 192)	Placebo (n = 191)	p Value
Male sex	145 (76)	160 (84)	0.06
Age, yrs	66 ± 10	66 ± 11	0.98
Diabetes mellitus	70 (37)	67 (35)	0.86
Systemic hypertension	148 (77)	160 (84)	0.13
Hypercholesterolemia	160 (83)	160 (84)	0.98
Current smokers	38 (20)	52 (27)	0.11
Previous myocardial infarction	62 (32)	69 (36)	0.50
Previous coronary intervention	72 (38)	75 (39)	0.80
Previous bypass surgery	16 (8)	18 (9)	0.85
Left ventricular ejection fraction, %	54 ± 7	55 ± 8	0.20
Serum creatinine, mg/dl	1.02 ± 0.31	1.06 ± 0.30	0.18
LDL cholesterol, mg/dl	92 ± 16	93 ± 17	0.55
Non–ST-segment elevation acute coronary syndrome	91 (47)	88 (46)	0.88
Multivessel coronary artery disease	88 (46)	98 (51)	0.33
Duration of statin therapy, months	9.1 ± 8.6	9.2 ± 9.2	0.91
Type of chronic statin therapy			
Atorvastatin	107 (55)	104 (55)	0.88
Simvastatin (+/− ezetimibe)	65 (34)	62 (32)	0.86
Rosuvastatin	13 (7)	16 (8)	0.69
Pravastatin	7 (4)	9 (5)	0.79
Other medical therapy			
Aspirin	191 (99)	191 (100)	1
Clopidogrel	192 (100)	191 (100)	—
Beta-blockers	80 (42)	74 (39)	0.63
ACE inhibitors or ARBs	124 (65)	133 (70)	0.35

Values are given as n (%) or mean ± SD.
ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; LDL = low-density lipoprotein.

Table 2, respectively. The 2 groups were similar for age, gender, prevalence of diabetes mellitus (37% and 35%), clinical presentation, left ventricular function, type of chronic statin therapy, renal function, and medical therapy at the time of PCI. Angiographic and procedural characteristics were also similar. Mean duration of chronic statin therapy was 9.1 ± 8.6 months in the atorvastatin reload and 9.2 ± 9.2 months in the placebo arm.

Procedural success was obtained in 191 of 192 patients (99.5%) in the treatment arm and in 190 of 191 (99.5%) in the placebo arm. Both procedural failures were due to inability to cross a chronic total occlusion. No patient had ≥2-mm side branch closure during intervention. All patients received the study-assigned drug (atorvastatin load or placebo) before PCI; no patient had an increase of liver enzymes (alanine aminotransferase and aspartate aminotransferase) above normal limits after statin treatment.

Primary end point. The 30-day composite primary end point of cardiac death, MI, and target vessel revascularization (Table 3) was observed in 3.7% of patients (7 of 192) in the atorvastatin reload and in 9.4% (18 of 191) in the placebo arm (p = 0.037). Incidence of MACE at 1 month was essentially due to periprocedural MI: 7 of 192 (3.7%) versus 17 of 191 (8.9%). Myocardial infarction was adjudicated on the basis of both CK-MB and troponin-I elevation (3 ×ULN) in 15 patients (62%), only troponin-I elevation without CK-MB in 6 patients (25%) and only CK-MB in 3 patients (13%). One patient in the placebo arm with severe left ventricular dysfunction (ejection fraction 30%) had PCI of the left anterior descending artery with periprocedural MI and died suddenly 4 days after intervention; acute stent thrombosis (by Academic Research Consortium definition) (13) occurred at 24 h in 1 patient of the placebo group who was successfully treated with re-PCI; this patient did not have elevation of cardiac markers fulfilling criteria for MI.

There were no side effects ascribable to atorvastatin or requiring discontinuation of the drug during follow-up.

Secondary end points. The prevalence of patients with pre-PCI cardiac marker elevation above ULN was similar in the atorvastatin load and placebo groups (CK-MB: 7% vs. 6%, p = 0.98; troponin-I: 20% vs. 17%, p = 0.63). After the procedure, the proportion of patients with any elevation above ULN of CK-MB and troponin-I was significantly lower in the atorvastatin arm (CK-MB: 13% vs. 24%, p = 0.017; troponin-I: 37% vs. 49%, p = 0.021).

The CRP levels were not significantly different in the 2 groups before (median: 2 mg/l, interquartile range [IQR] 1 to 8 vs. 2 mg/l, IQR 1 to 5) and after PCI (5 mg/l, IQR 2 to 9 vs. 5 mg/l, IQR 2 to 9); PCI-induced increase of CRP levels from baseline tended to be lower in the atorvastatin reload arm (median: 1 mg/l, IQR 0 to 3 vs. 2 mg/l, IQR 0 to 5; p = 0.10).

Table 2 Procedural Features in the Atorvastatin Reload and Placebo Groups

Variable	Atorvastatin (n = 192)	Placebo (n = 191)	p Value
Vessels treated	231	228	—
Left main	2 (1)	2 (1)	0.63
Left anterior descending	98 (42)	103 (45)	0.62
Left circumflex	67 (29)	56 (24)	0.33
Right coronary artery	61 (27)	61 (27)	0.98
Saphenous vein grafts	3 (1)	6 (3)	0.69
Restenotic lesions	18 (9)	19 (10)	0.99
Lesion type B2/C	108 (56)	101 (53)	0.58
Multivessel intervention	34 (18)	34 (18)	0.91
Type of intervention			
Balloon only	13 (7)	11 (6)	0.84
Stent	179 (93)	180 (94)	0.84
Bifurcations with kissing balloon	5 (3)	5 (3)	0.76
No. of stents per patient	1.3 ± 0.7	1.3 ± 0.7	0.99
Stent diameter, mm	2.9 ± 0.6	2.9 ± 0.5	0.96
Total stent length, mm	16.8 ± 7.2	17.1 ± 7.7	0.69
Use of drug-eluting stents	63 (32)	69 (36)	0.57
Direct stenting	79 (41)	74 (39)	0.71
Stent deployment pressure, atm	13 ± 3.9	13 ± 3.6	0.96
Duration of stent deployment, s	18 ± 9	18 ± 8	0.94
Use of post-dilation	73 (38)	75 (39)	0.88
Use of glycoprotein IIb/IIIa inhibitors	23 (12)	23 (12)	0.89
Antithrombin therapy during intervention			
Unfractionated heparin	173 (90)	170 (89)	0.85
Bivalirudin	19 (10)	21 (11)	0.85

Values are given as n (%) or mean ± SD.

Patients with ACS had a significant benefit with atorvastatin reload (MACE incidence: 3.3% vs. 14.8% in the placebo arm; p = 0.015), whereas event rates in patients with stable angina were 4% versus 4.9%, respectively (p = 0.98) (Fig. 2). Test of interaction (14) between clinical syndrome and atorvastatin reload was significant (z = 2.0; p = 0.022).

Multivariable analysis. Multivariable analysis (Fig. 3) identified atorvastatin reload as a predictor of decreased risk of MACE at 30 days (OR: 0.50, 95% CI: 0.20 to 0.80; 50% relative risk reduction [RRR]; p = 0.039); patients receiving multiple stent implantation had an increased risk of events, as well as those requiring periprocedural use of glycoprotein IIb/IIIa inhibitors. No difference in benefit was found with reload in patients treated with drug-eluting versus bare-metal stents or bivalirudin versus unfractionated heparin. Logistic regression analysis in the pre-specified clinical subgroups revealed a significant benefit on 30-day MACE in response to atorvastatin reload in patients with ACS (OR: 0.18, 95% CI: 0.10 to 0.83; RRR: 82%; p = 0.027) and a nonsignificant benefit in those with stable angina (OR: 0.74, 95% CI: 0.20 to 2.9; p = 0.70).

Table 3 Individual and Combined Outcome Measures of the Primary End Point at 30 Days in the Atorvastatin Reload and Placebo Groups

	Atorvastatin Reload (n = 192)	Placebo (n = 191)	p Value
Cardiac death	0	1 (0.5)	NS
Myocardial infarction	7 (3.7)	17 (8.9)	0.056
Stent thrombosis	0	1 (0.5)	NS
Target vessel revascularization	0	1 (0.5)	NS
Total MACE	7 (3.7)	18 (9.4)	0.037

Values are given as n (%). The events are not mutually exclusive.
MACE = major adverse cardiac events.

Discussion

The ARMYDA-RECAPTURE trial indicates that a short-term pre-treatment with high-dose atorvastatin load before PCI improves outcome in patients already receiving chronic statin therapy. In particular, an acute bolus of 80-mg atorvastatin given 12 h before intervention followed by a further 40-mg pre-procedural dose was associated with 50% relative risk reduction of MACE at 30 days versus placebo. As such, given the large proportion of patients (70% in the ARMYDA-RECAPTURE centers) undergoing PCI while on chronic statin therapy, the study answers a relevant question in interventional cardiology. Excluding 1 cardiac death in the placebo arm, the benefit was essentially driven by a 2.4-fold reduction of periprocedural MI; myocardial protection by atorvastatin reload was also expressed by significantly lower proportion of patients with post-procedural increase of cardiac markers (CK-MB and tropo-

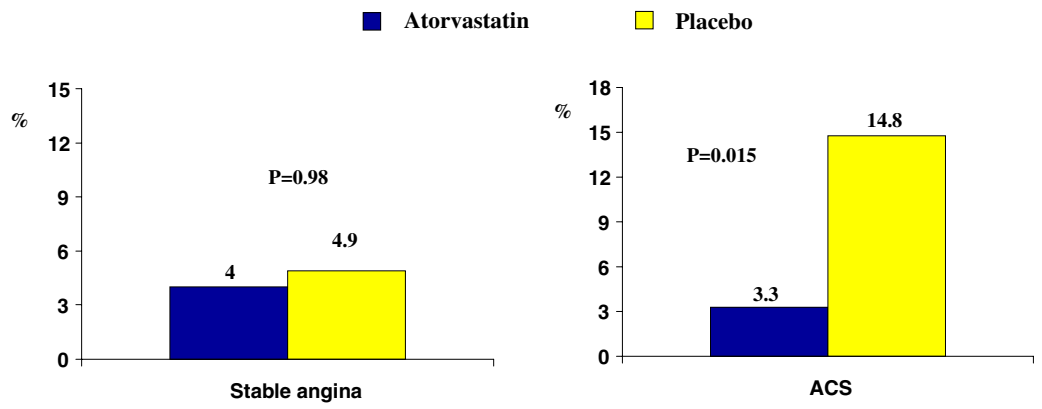

Figure 2 **Secondary End Points**

Incidence of major adverse cardiac events at 30 days according to clinical presentation (stable angina vs. acute coronary syndrome). ACS = acute coronary syndrome.

nin-I); according to our data, 17 patients should be reloaded with atorvastatin in order to prevent 1 adverse event (number needed to treat).

In the original ARMYDA (6) and in the ARMYDA-ACS (7) trials only statin-naïve patients were enrolled. In the former study, patients with chronic stable angina were randomized to receive 7-day pre-treatment before PCI with atorvastatin 40 mg/day or placebo, and a significant 81% risk reduction of periprocedural MI was observed in the statin arm. The ARMYDA-ACS trial more recently enrolled patients with unstable angina or non–ST-segment elevation ACS, in whom a scheme of atorvastatin administration similar to ARMYDA-RECAPTURE led to 88% risk reduction of cardiac events at 1 month versus placebo, as well as to 3-fold reduction of periprocedural MI.

Possible mechanisms of atorvastatin cardioprotection have been investigated in the ARMYDA-CAMs (Atorvastatin for Reduction of Myocardial Damage During Angioplasty–Cell Adhesion Molecules) study (15), a planned subanalysis demonstrating that procedural protection in the atorvastatin arm was paralleled by reduction of PCI-induced endothelial activation, as expressed by significant attenuation in the increase of intercellular cell adhesion molecule-1 and E-selectin levels at 24 h after intervention. Other explanations include atorvastatin-induced early increase of endothelial progenitors cells differentiation and subsequent augmentation of circulating endothelial progenitors cells, with attendant cardioprotective effects (16). Those acute effects of short-term treatment may support a lipid-lowering independent mechanism of action; this is in accordance also with animal studies that have shown a reduction of infarct size when an acute statin load is given before ischemia (17) or before reperfusion (18). Interestingly, whereas in the animal model this cardioprotection may wane with time, it can be restored with an acute high dose atorvastatin given immediately before ischemia/reperfusion (19,20); this phenomenon may have potential clinical relevance.

Thus, the primary benefit derived from atorvastatin reload in ARMYDA-RECAPTURE appears to be again a reduction in periprocedural MI, largely localized to those patients who presented with ACS. Indeed, the relative magnitude of benefit afforded patients with ACS (MACE RRR of 82%; p = 0.027), compared with stable angina patients (MACE reduction of 26%; p = 0.70) is striking and drives the benefit observed for oral atorvastatin loading. Analysis of interaction between acuity of clinical presenta-

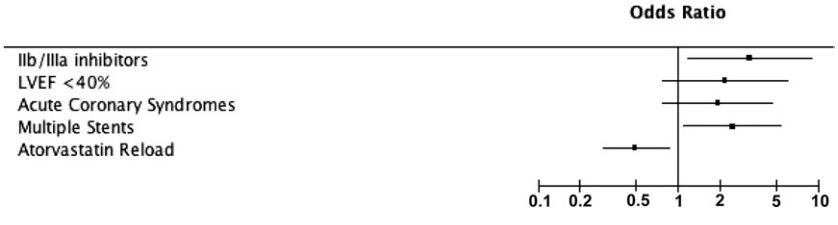

Figure 3 **Odds Ratio for 30-Day Major Adverse Cardiac Events**

Results of multivariable analysis showing 50% major adverse cardiac events risk reduction at 30 days with atorvastatin (p = 0.039). Log axis has been used to present the odds ratios. LVEF = left ventricular ejection fraction.

tion and response to atorvastatin reload was significant in favor of ACS patients. It would appear then that statin-naïve patients undergoing either elective PCI for chronic stable angina or semi-urgent PCI for ACS enjoy a significant reduction in MACE following oral atorvastatin loading regimens (21–23), as confirmed also by the recent NAPLES II (Novel Approaches for Preventing or Limiting Events II) trial (24), which used a single 80-mg atorvastatin bolus before PCI. However, among chronic statin-treated patients, those presenting with ACS derive disproportionate benefit and, according to our study, should receive atorvastatin reload. This appropriate, selective reloading of the ACS cohort is illustrated by a number needed to treat of 9 in order to prevent 1 MACE versus 111 for patients with stable angina. Although the pathophysiological explanation for atorvastatin loading benefit in statin-naïve patients could be lack of statin-mediated plaque stabilizing effect (25,26), in ACS patients "breakthrough" plaque instability with increased or "resistant" plaque inflammation likely explains the relative benefit of atorvastatin reload. The rapid, anti-inflammatory, antithrombotic effects of atorvastatin have been described (27,28).

It is likely that ACS patients have increased plaque inflammatory cell density (macrophages and T lymphocytes) with consequent greater local production of inflammatory cytokines (15), as well as suppression of anti-inflammatory mediators (nitric oxide synthase). Thus, although it is conceivable that patients on chronic statin therapy would already have some degree of myocardial protection during PCI, the presence of breakthrough plaque inflammation in the ACS cohort requires the acute suppression afforded by atorvastatin reload (similar to the observation made in the original ARMYDA-ACS study) (7). Furthermore, a dose-dependent platelet inhibitory/anti-inflammatory effect of atorvastatin may have been operative: in vivo platelet activation and plasma chemokine levels have been demonstrated to be reduced more effectively by higher atorvastatin doses through low-density lipoprotein-independent mechanisms (29). As thrombosis and inflammation are intrinsically linked in the pathogenesis of periprocedural myonecrosis in the setting of PCI, especially in ACS patients, this concept may support the utilization of high dose, intensive atorvastatin load in our study.

If these observations regarding an independent, selective benefit of statin reloading in ACS patients are confirmed by future studies, the ARMYDA-RECAPTURE trial may have significant influence in clinical practice for the acute care of non–ST-segment elevation ACS.

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Key Words: coronary artery disease ■ atorvastatin ■ percutaneous coronary intervention ■ myocardial infarction.

APPENDIX

For a list of ARMYDA-RECAPTURE investigators, please see the online version of this article.