Coumarins and aspirin reduced clinical events more than did aspirin alone when drugs were started before scheduled PTCA

ten Berg JM, Kelder JC, Suttorp MJ, et al. **Effect of coumarins started before coronary angioplasty on acute complications and long-term follow-up. A randomized trial.** Circulation. 2000 Jul 25; 102:386-91.

QUESTION

In patients scheduled for percutaneous transluminal coronary angioplasty (PTCA), are coumarins and aspirin more effective than aspirin alone for reducing adverse clinical outcomes?

DESIGN

Randomized (allocation concealed*}†, blinded (outcome assessors),* controlled trial with 1-year follow-up (Balloon Angioplasty and Anticoagulation Study [BAAS]).

SETTING

1 hospital in The Netherlands.

PATIENTS

1058 patients (mean age 60 y, 78% men) with symptomatic coronary artery disease who were scheduled for PTCA. Exclusion criteria were myocardial infarction within 24 hours of PTCA, use of oral anticoagulants, contraindications to study drugs, or target lesion in a bypass graft. 98% of patients were included in the analysis.

INTERVENTION

Patients with stable angina were enrolled ≥ 1 week before scheduled PTCA, and patients with unstable angina were enrolled ≥ 1 day before PTCA. All patients were given long-term aspirin with a loading dose of 300 mg/d before PTCA and 100 mg/d thereafter. Heparin was given before PTCA to patients with unstable angina and to all patients during PTCA (10 000-U bolus immediately before and 5000 U/h during the procedure). 530 patients were allocated to coumarin, which was begun before PTCA and continued for 6 months with adjustment to keep the prothrombin time at 2.1 to 4.8 international normalized ratio (INR). 528 patients were allocated to no further intervention.

MAIN OUTCOME MEASURE

Composite end point of death, myocardial infarction, target-lesion revascularization, and stroke at 1 year.

MAIN RESULTS

Patients in the coumarin group had a lower rate of the composite end point at 1 month ($P = 0.01$) and 1 year ($P = 0.005$) than did patients in the aspirin-alone group (Table). They also had a higher rate of major bleeding in the hospital combined with false aneurysm ($P = 0.005$), although few events occurred.

CONCLUSION

Coumarin therapy in addition to aspirin was more effective than aspirin alone for reducing adverse clinical outcomes when started before scheduled PTCA.

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*See Glossary.

†Information supplied by author.

Coumarins plus aspirin vs aspirin alone started before scheduled PTCA‡

Outcomes	Coumarin	Aspirin	RRR (95% CI)	NNT (CI)
Composite at 30 d	3.4%	6.4%	47% (9 to 70)	33 (17 to 222)
Composite at 1 y	14%	20%	29% (8 to 46)	17 (10 to 73)
			RRI (CI)	NNH (CI)
Major bleed or false aneurysm	3%	1%	238% (31 to 780)	44 (24 to 169)

‡The composite end point includes death, myocardial infarction, target-vessel revascularization, and stroke. Abbreviations defined in Glossary; RRR, RRI, NNT, NNH, and CI calculated from data in article.

COMMENTARY

ten Berg and colleagues show that anticoagulation with aspirin and coumarins that is started before PTCA and continued for 6 months reduces acute events and target-lesion revascularization better than aspirin alone. 35% of the patients received provisional stenting after suboptimal balloon results. Patients assigned to coumarins who received provisional stenting also had a better 30-day outcome with no increased risk for stent thrombosis. This finding occurred despite more frequent use of ticlopidine in patients in the aspirin-alone group who received stents. In contrast to balloon angioplasty, coumarins provided no revascularization benefit in patients who received stents.

Elective stenting has become the dominant PTCA intervention in the United States but not in all European countries. The Stent Anticoagulation Restenosis Study (STARS) (1) has shown that aspirin plus ticlopidine after treatment has a lower rate of stent thrombosis than does aspirin with warfarin or aspirin alone in patients with elective stenting. STARS supports 2 biological hypotheses. First, stent thrombosis is primarily a platelet-mediated event. Second, transient hypercoagulability from suppression of proteins C and S before anticoagulation from inhibition of factors X, IX, VII, and II may explain warfarin's inferiority. Although treatment with warfarin plus aspirin after stenting was marginally better than that with aspirin alone with elective stenting in the STARS trial, the combination of therapeutic coumarins and aspirin at the time of intervention is clearly better than aspirin alone in patients receiving provisional stents in the study by ten Berg and colleagues.

Whether coumarin plus aspirin before elective stenting would be better than the excellent results currently achieved with thienopyridines plus aspirin in elective stenting is unknown. Giving coumarins before treatment is logistically difficult. Administration of glycoprotein IIb/IIIa therapy to patients with therapeutic INRs would also pose a substantial bleeding risk. The applicability of the positive results with coumarins given before PTCA to the current interventional practice appears limited.

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Reference

1. **Leon MB, Baim DS, Popma JJ, et al.** N Engl J Med. 1998;339:1665-71.

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