Long-term treatment with anticoagulant treatment is indicated in patients with mechanical heart valves, and in most patients with atrial fibrillation [1]. Approximately one-third of these patients have concomitant significant coronary artery disease that may require percutaneous coronary intervention (PCI) with stenting, under which circumstances, double antiplatelet therapy with aspirin and clopidogrel is currently utilized to prevent stent thrombosis (ST). However, this combination of oral anticoagulants and dual antiplatelet therapy is associated with a high annual risk (4–16%) of fatal and nonfatal bleeding episodes [2]. Guidelines, based on expert consensus, recommend triple antithrombotic therapy, involving oral anticoagulants with a revised target international normalization ratio, aspirin, clopidogrel (for as short a time as possible), radial approach and extensive use of proton pump inhibitors; however, this strategy has not been prospectively validated [1].

Dewilde et al. published the randomized, open-label, multicenter, controlled WOEST trial in the Lancet recently [3]. They demonstrated that patients undergoing PCI had a significantly lower risk of bleeding complications at 1-year follow-up when treated with double therapy (oral anticoagulants and clopidogrel) compared with triple therapy (aspirin, clopidogrel and oral anticoagulation), with no evidence of an increased risk of thrombotic events.

A total of 573 patients were enrolled and 1-year follow-up was available for 563 (98.25%) patients. A total of 54 (19.4%) patients receiving double therapy, and 126 (44.4%) receiving triple therapy (hazard ratio [HR] 0.36; 95% CI: 0.26–0.50; p = 0.0001) experienced bleeding episodes. The combined secondary end point of death, myocardial infarction, stroke, target-vessel revascularization and ST was reported in 31 (11.1%) who received double therapy and in 50 (17.6%) patients who received triple therapy (HR: 0.60; 95% CI: 0.38–0.94; p = 0.025). The HR remained similar after correction for imbalance in baseline characteristics (0.56; 95% CI: 0.35–0.91).

The authors conclude that aspirin use is not necessary in patients receiving oral anticoagulants and undergoing PCI.

In our opinion, the WOEST trial provides very important data, for this special population of patients, and insights into potential future directions without using aspirin for all patients after coronary stenting. Other potential considerations include: first, in the studied population, only 35% of patients used proton pump inhibitors, 25% of patients had a radial PCI and 30% of patients received a bare-metal stent. Bleeding episodes might have been prevented with an increased use of proton pump inhibitors, radial access for PCI and bare-metal stent
Bedside monitoring to adjust antiplatelet therapy for coronary stenting (ARCTIC trial)


Dual antiplatelet therapy with aspirin and clopidogrel is recommended for the prevention of atherothrombotic events in patients who have acute coronary syndromes or are undergoing PCI [1,2]. However, despite such treatment, a substantial number of MACEs and especially ST still occur, which can partly be explained by the high on clopidogrel treatment platelet reactivity, present in about one-third of these patients [3–5]. Platelet-function testing can enable quantification of the degree of platelet reactivity during antiplatelet treatment and, potentially, the identification of patients in whom personalized antiplatelet therapy is necessary to minimize the risks of both ischemic and bleeding complications [6].

In the randomized, open-label, multicenter ARCTIC trial recently published in the *New England Journal of Medicine*, Collet et al. demonstrated that there were no significant improvements in clinical outcomes with platelet function monitoring and treatment adjustment for coronary stenting, as compared with standard antiplatelet therapy without monitoring [7]. The investigators randomly assigned 2440 patients scheduled for PCI were randomly allocated to a strategy of platelet-function monitoring, with drug adjustment in patients who had a poor response to antiplatelet therapy, or to a conventional strategy devoid of monitoring and drug adjustment. The primary end point was the composite of death, myocardial infarction, ST, stroke or urgent revascularization 1 year after stent implantation. The VerityNow P2Y12 and aspirin point-of-care assays were used for patients in the monitoring group before stent implantation and in the outpatient clinic 2–4 weeks later. In the monitoring group, high platelet reactivity (platelet reaction units >235) in patients taking clopidogrel (34.5% of patients) or aspirin (aspirin reactions units >550; 7.6%) led to the administration of an additional bolus of clopidogrel, prasugrel, or aspirin along with glycoprotein IIb/IIIa inhibitors during the procedure. The primary end point was observed in 34.6% of the patients in the monitoring group, as compared with 31.1% of those in the conventional-treatment group (HR: 1.13, 95% CI: 0.98–1.29; p = 0.10). The main secondary end point, ST or any urgent revascularization, occurred in 4.9% of the patients in the monitoring group and 4.6% of those in the conventional treatment group (hazard ratio, 1.06, 95% CI: 0.74–1.52; p = 0.77). The rate of major bleeding events was not significantly different between groups. The authors conclude that their data do not support the routine use of platelet-function testing in patients undergoing coronary stenting.


Although the ARCTIC trial provides important information for the individualized, VerifyNow-guided, antiplatelet therapy in patients undergoing PCI with drug-eluting stents, few considerations should be mentioned: only 27.0% of patients presented with an acute coronary syndrome; no ST-segment elevation myocardial infarction patients included; different cut-off value might have been more discriminating (e.g., platelet reaction units of 208); only one platelet-function testing was used; and at the time of the procedure, 80.2% of the poor responders immediately received an additional loading dose of clopidogrel, and only 3.3% received an additional loading dose of prasugrel. A randomized study in acute coronary syndrome high-risk patients, with a cutoff value of 208 for platelet reaction units, might have been more discriminating (e.g., arterial bypass graft surgery (CABG) and PCI is an important limitation. The anatomical SYNTAX score II contained eight predictors: anatomical SYNTAX score, age, creatinine clearance, left ventricular ejection fraction, presence of unprotected left main coronary artery disease, peripheral vascular disease, female sex and chronic obstructive pulmonary disease. SYNTAX score II predicted a significant difference in 4-year mortality between patients undergoing CABG and those undergoing PCI (p = 0.0037). In order to achieve similar 4-year mortality after CABG or PCI, younger patients, women and patients with reduced left ventricular ejection fraction required lower anatomical SYNTAX scores, whereas older patients, patients with unprotected left main coronary artery disease and those with chronic obstructive pulmonary disease, required higher anatomical SYNTAX scores. The incidence of diabetes was not significant for decision-making between CABG and PCI (p = 0.67).

SYNTAX score II provides a very important tool for clinicians to evaluate the importance of anatomical and clinical factors in the decision over the optimum revascularization technique for individual patients with complex coronary artery disease.

Reference

**Anatomical and clinical characteristics to guide decision making between coronary artery bypass surgery and PCI: the SYNTAX score II**


The anatomical SYNTAX score is used as a tool to help clinicians decide the best revascularization therapy in patients with complex coronary artery disease [1]. However, the absence of clinical parameters to tailor decision-making between coronary artery bypass graft surgery (CABG) and PCI is an important limitation.

The SYNTAX score II was developed as a result of the application of a Cox proportional hazards model to results of the randomized all-comers SYNTAX trial (n = 1800) [2]. The baseline features which bear strong associations with 4-year mortality in either or both of the CABG or PCI settings were added to the anatomical SYNTAX score. Comparisons of 4-year mortality predictions between CABG and PCI were made for each patient. SYNTAX score II contained eight predictors: anatomical SYNTAX score, age, creatinine clearance, left ventricular ejection fraction, presence of unprotected left main coronary artery disease, peripheral vascular disease, female sex and chronic obstructive pulmonary disease. SYNTAX score II predicted a significant difference in 4-year mortality between patients undergoing CABG and those undergoing PCI (p = 0.0037). In order to achieve similar 4-year mortality after CABG or PCI, younger patients, women and patients with reduced left ventricular ejection fraction required lower anatomical SYNTAX scores, whereas older patients, patients with unprotected left main coronary artery disease and those with chronic obstructive pulmonary disease, required higher anatomical SYNTAX scores. The incidence of diabetes was not significant for decision-making between CABG and PCI (p = 0.67).

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