Reduction of oxidative stress: a new indication for acetylsalicylic acid in coronary artery bypass surgery

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Treatment options for coronary artery disease (CAD) are still undergoing rapid development in the early 21st century. Besides percutaneous coronary intervention, coronary artery bypass grafting (CABG) is the fundamental treatment of symptomatic CAD patients with 1081 CABG surgeries per million adults per year in 2007–08 in the USA [1]. Due to its antiplatelet effect, acetylsalicylic acid (ASA) treatment is of vital importance in CAD patients and has been proven to be beneficial for patients after CABG by improving graft patency [2]. However, ASA carries the risk of increased postoperative bleeding complications in patients undergoing CABG operations, and the timing of preoperative ASA discontinuation has therefore been discussed controversially [3].

An increasing body of evidence has shown over the last decade that antiplatelet drugs not only impair platelet aggregation, but furthermore, reduce systemic inflammation and oxygen radical production [4, 5]. As recent studies have shown that CABG is often associated with systemic oxidative stress and consecutive inflammation impairing the postoperative patient outcome, the question has arisen whether ASA reduces perioperative, systemic inflammation in patients undergoing CABG operations and thereby improves the postoperative outcome [6].

In the current issue of the EJCTS, Berg et al. [7] investigated, in an exploratory clinical study, the impact of ASA treatment on oxidative and inflammatory parameters in patients undergoing CABG operations. To address this issue, they assessed inflammatory blood markers in patients treated with ASA until operation (n = 11) compared with those in which ASA was stopped 7 days prior to bypass grafting (n = 7). The main findings were that high-sensitivity C-reactive protein and 8-iso-prostaglandin F2alpha (8-iso-PGF2alpha) (8-iso-PGF2alpha, which are biomarkers predicting adverse outcome after CABG surgery, were reduced in patients who were treated with ASA until the operation, when compared with those who had stopped ASA a week before surgery [8]. Additionally, patients with continued ASA medication showed a trend towards reduced myocardial injury as assessed by troponin T levels. Interestingly, Berg et al. did not observe any significant differences in bleeding complications within the first 18 h between both groups.

Thus, ASA reduces systemic inflammation in CABG patients without increasing the risk of bleeding complications. Although patient numbers are small in the present study, the results are in accordance with recent subanalyses of large randomized trials on third generation adenosine diphosphate (ADP)-receptor

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antagonists. In these trials, evaluating prasugrel or ticagrelor compared with clopidogrel—all in combination with ASA—patients receiving the stronger ADP-receptor antagonists fared better in terms of mortality even though bleeding was increased [9, 10]. Thus, treatment with antiplatelet drugs is beneficial not only in patients with acute coronary syndromes or coronary stent implantation, but also in patients undergoing CABG. Many surgeons understandably fear the increased bleeding risk that comes along with potent antiplatelet drugs. This risk has not been substantiated in the present study, a finding that may be partially due to the small sample size. However, even if patients did bleed more when treated with ASA or other potent antiplatelet drugs in the perioperative phase, is this not to be accepted in view of the overall benefit and improved survival? Patients will be grateful if their surgeon is willing to be extra careful and to deal with perioperative bleeding in order to allow them to take advantage of these drugs. Obviously, it remains to be elucidated by future research that the mechanism of ASA contributes more to better outcomes—antioxidative features or platelet inhibition. However, Berg et al. ought to be congratulated for having stimulated this discussion by their intriguing findings. Independent of the underlying mechanism, patients planning to undergo CABG should receive ASA whenever possible.

REFERENCES


