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COMMENTARY

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Secondary prevention is as important as surgical technique

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Coronary artery bypass grafting (CABG) is the treatment of choice for patients with complex coronary artery disease. In the U.S. alone, approximately 300,000 patients undergo CABG annually. Saphenous vein grafts (SVG) are used in more than 90% of CABG procedures.[1] SVGs have a higher rate of failure than arterial grafts, with contemporary rates of SVG occlusion of 6% at 1 month, 10% at 3–6 months, and 13% at 6–12 months.[2] Thrombosis and technical failure is the predominant pathophysiologic mechanism of SVG failure within the first week and during the first month after CABG, followed by intimal hyperplasia from 1 month to 1 year, and atherosclerosis beyond 1 year.[3] A multitude of studies have focused on determining factors associated with SVG occlusion during the first year after CABG.

In this issue of the *Journal of Cardiac Surgery*, Yang et al.[4] assessed vein graft disease (VGD) progression between 1 week and 1 year after CABG. The current report draws on a previously described cohort of 233 patients who underwent computed tomographic angiography (CTA) 1 week after off-pump CABG,[5] and includes 218 of these patients (654 SVG) who subsequently underwent CTA at 1 year. The authors found that, overall, VGD progression between 1 week and 1 year occurred in 11.3% of SVG, and 22.1% of patients. VGD progression was particularly evident in those SVG that already demonstrated VGD 1 week after CABG and occurred in 38.6% of SVG with Fitzgibbon B patency, whereas only 11.3% of perfectly patent SVG (Fitzgibbon A) demonstrated signs of VGD at 1 year, a difference that was statistically significant.

In a novel approach to examine the association of the success (or lack thereof) of their implementation of secondary prevention measures with VGD progression, the authors generated a risk score derived from their assessment of patients achieving defined targets of lipid levels, glucose control, smoking cessation, and hypertension control 1 year after CABG. The failure to meet any one secondary prevention target contributed one point to the risk score, which was included as a variable in the logistic regression model. The authors demonstrated that the risk score was significantly associated with VGD progression both at the graft (odds ratio [OR] = 1.38; p for trend = .01) and the patient level (OR = 1.52, p for trend = .01).

The findings of Yang et al. underscore the importance of secondary prevention after CABG. To date, only the use of postoperative antiplatelet therapy and statins has been shown in randomized clinical trials (RCT) to reduce SVG failure. A 1993 meta-analysis of seven RCTs including 1443 patients showed that the use of aspirin after CABG was associated with a lower risk of SVG occlusion.[6] A recent meta-analysis involving 1316 patients and 1668 SVG showed that adding ticagrelor to aspirin was associated with a significantly lower incidence of SVG failure (11.2%) per graft than was aspirin (20%; difference, −8.7% [95% confidence interval, CI, −13.5% to −3.9%]; OR, 0.51 [95% CI, 0.35–0.74]; $p < .001$).[7] Aggressive lipid-lowering reduced progression of atherosclerosis in grafts in the post-CABG trial.[8] In addition, higher low-density lipoprotein (LDL) levels during the first postoperative year were associated with significantly greater VGD 3 years after CABG in the aggressive cholesterol therapy to inhibit vein graft events trial.[9] Diabetes mellitus and active smoking have been postulated among the predictors for early SVG occlusion.[2] In this regard, the current work confirms that lack of glycemic control and failure of smoking cessation correlates with progression of VGD between 1 week and 1 year after CABG.

In an analysis from the SWEDEHEART registry, treatment with statins (hazard ratio [HR]: 0.56, 95% CI, 0.52–0.60), RAAS inhibitors (HR: 0.78, 95% CI, 0.73–0.84), and platelet inhibitors (HR: 0.74, 95% CI, 0.69–0.81) were individually associated with lower mortality risk after CABG.[10] In a subanalysis of the Synergy between PCI With Taxus and cardiac surgery Extended Survival study,[11] patients on optimal medical therapy at 5 years had significantly lower mortality at 10 years compared with those on ≤2 types of medications (13.1% vs. 19.9%; adjusted HR: 0.470; 95% CI, 0.292–0.757; $p = .002$). An astonishing finding in the current work was that despite 96.3% of patients receiving statins 1 year after CABG, 56.4% of patients did not meet the study-specified target LDL level of <1.8 mmol/L, which in addition remains well above the European Society of Cardiology guideline-recommended target of <1.4 mmoL/L for secondary prevention of cardiovascular disease.[12]

On the basis of the data of Yang and colleagues, we are reminded that, very likely, a large proportion of patients remain undertreated in terms of secondary prevention after CABG, and that optimal medical therapy is as important as the surgical procedure itself.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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