weight or larger trials), however, was able to demonstrate a statistically significant benefit to on-pump CABG, likely due to a relatively small number of events of interest. In a meta-analysis of 41 randomized trials, significantly fewer distal anastomoses were performed after off-pump surgery (weighted mean difference, -0.29; 95% CI, -0.46 to -0.13). In addition, our previous meta-analysis of six randomized trials demonstrated a significant increase in overall graft occlusion (risk ratio [RR], 1.27; 95% CI, 1.03–1.56; P = 0.0234; risk difference [RD], 3.0%; 95% CI, 0.6–5.4%; P = 0.0129), especially in venous graft occlusion (RR, 1.28; 95% CI, 1.06–1.54; P = 0.0094; RD, 4.0%; 95% CI, 0.2–7.8%; P = 0.0396), with off-pump relative to on-pump CABG. Fewer bypass grafts [1] (or distal anastomoses [2–4]) and lower graft patency [3, 5, 6] in off-pump than on-pump CABG could explain higher repeat revascularization rates following off-pump CABG demonstrated in the present meta-analysis. Further, higher repeat revascularization rates are probably due to increased recurrent angina and may impair quality of life. Because no criteria for indication of repeat revascularization were predefined in all the included trials, further analyses should be required.

SUPPLEMENTARY MATERIAL

Supplementary material is available at ICVTS online.

Conflict of interest: none declared.

REFERENCES


eComment. Stroke rate after surgical myocardial revascularization

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I read with great interest the paper by Takagi et al. in which they tried to answer an important question. Does off-pump coronary artery bypass grafting (CABG) increase the risk of repeat coronary revascularization when compared with on-pump CABG? [1] Data from this meta-analysis confirm that the decreased benefits from on-pump CABG is attributable to the higher incidence of fewer bypass grafts and lower graft patency yielding incomplete and repeat revascularization with this technique.

In this valuable meta-analysis, I think that there is yet another topic to be discussed. Proponents of off-pump CABG have claimed that this technique limits the rate of postoperative stroke by avoiding aortic cannulation/decannulation, micro-gaseous and small particulate emboli from the pump circuit and aortic cross-clamping. Off-pump technique does not totally eliminate the necessity for aortic clamping. However, in beating heart operations with no-touch aorta technique, cerebral embolic load is completely reduced by avoiding aortic cross-clamping. Yet, there is still the hazard for neurological insult related to periods of hypotension during manipulation of the heart.

Three large clinical trials have been conducted recently comparing outcomes in cardiac surgery patients using off-pump and on-pump strategy. The Randomized On/Off Bypass (ROOBY) trial [2] is a single-blinded randomized trial involving 2203 patients in 18 Veterans Affairs medical centres. There was no significant difference between off-pump and on-pump CABG in the rate of the 30-day stroke (1.3% and 0.7%, respectively; P = 0.28). Recently, the results of the Coronary Artery Bypass Surgery Off or On Pump Revascularization Study (CORONARY) [3] has been published. This prospective study involved 4752 patients randomized to either on- or off-pump CABG in 79 centres and 19 countries. The use of off-pump CABG, as compared with on-pump CABG, did not reduce the rate of non-fatal stroke (1.0% vs 1.1%, respectively; P = 0.89) at 30 days or at one year (1.5% vs 1.7%, respectively; P = 0.24). Diegeler et al. reported their results from the German Off-Pump Coronary Artery
Bypass Grafts in Elderly Patients (GOPCADE) trial [4]. This trial attempts to define the potential benefits of OPCAB in an elderly group (aged more than 75 years) with multiple comorbidities. The study involved 2539 patients from 12 centres. There was no significant difference between patients who underwent off-pump surgery and those who underwent on-pump surgery in terms of rate of stroke (2.2% vs 2.7%, respectively, \( P = 0.47 \)) at 30 days or at one year after randomization (3.5% vs 4.4%, respectively, \( P = 0.26 \)). Of note, the higher stroke rate in the last trial is attributed to the increased operative risk of the study population.

None of these large randomized trial could demonstrate any superiority of off-pump CABG over on-pump CABG in terms of reduced risk of CABG-related stroke. Nevertheless, data regarding quality of the proximal aorta and cross-clamping technique of the aorta are lacking in these trials. Preoperative and intraoperative screening can identify extensive atherosclerosis of the ascending aorta. Selective use of off-pump no-touch aorta CABG in this group of high-risk patients can prevent adverse neurologic injury.

Conflict of interest: none declared

References


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References


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References