New-onset perioperative atrial fibrillation in cardiac surgery patients

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New-onset perioperative atrial fibrillation in cardiac surgery patients: transient trouble or persistent problem?

New-onset atrial fibrillation (AF) is the most frequent postoperative complication occurring after cardiac surgery. Despite its high incidence, uncertainty remains regarding the long-term significance of postoperative atrial fibrillation (POAF). Clinicians struggle to identify which, if any, patients who develop POAF should receive life-long oral anticoagulation to reduce their risk of stroke.

Bidar *et al.*[1] used implantable loop recorders (ILRs) to track early and late POAF occurrences in 79 cardiac surgery patients in the Netherlands. They defined 'early POAF' as AF occurring within 5 days after surgery and 'late POAF' as occurring after this period. Early POAF lasting at least 2 min was detected in 27 patients [95% confidence interval (CI): 24–46%]. Among this group, 67% (95% CI: 46–83%) experienced late AF recurrence over an average follow-up of 29 months (range: 4 days–53 months).[1] These results are similar to those from a contemporary study by Abdelmoneim *et al.*[2] using ILR that detected AF recurrence in 71% (95% CI: 55–84%) of 42 American cardiac surgery patients with newly-onset POAF over a mean follow-up of 1.7 ± 1.2 years.

These studies both documented high AF recurrence rates in patients with POAF and call into question current practices in the long-term management of patients with POAF.[3] It is known that longer durations of electrocardiogram (ECG) monitoring will capture more AF episodes and that longer AF episodes are associated with a higher risk of stroke.[4] Two important questions however remain: how long should patients with POAF be monitored for AF recurrence and what duration of AF warrants lifelong anticoagulation? There are currently myriad ECG monitoring methods available, ranging from intermittent methods that patients can use at home (e.g. hand-held ECG), to traditional continuous ambulatory ECG monitors with durations ranging from 24 h to 14 days, to modern ILRs with upwards of 3 years of battery life.[5] It is not practical and prohibitively expensive to monitor all cardiac surgery patients with ILRs, but shorter monitoring may underestimate AF recurrence.

Postoperative atrial fibrillation occurs in 25–40% of cardiac surgery patients and effective stroke prevention therapies are readily available: improving risk stratification for these patients should be a priority. Identifying the optimal monitoring strategy and the minimum AF burden associated with a stroke risk that justifies oral anticoagulation are central to such a strategy. Prospective, multicentre studies are needed to clarify the management of this population.

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New-onset perioperative atrial fibrillation in cardiac surgery patients: transient trouble or persistent problem?—Authors' reply

We are grateful for the opportunity to respond to the questions raised in Dr Kaur's letter.[1] Previously, our group showed that atrial fibrillation (AF) in the first days after cardiac surgery is associated with high AF recurrence rate during

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long-term continuous rhythm follow-up suggesting that postoperative AF (POAF) is not limited to the perioperative phase. Based on these findings, two relevant questions regarding the long-term management of patients with POAF arise.

Firstly, it remains unclear for how long patients with early-POAF (POAF during first 5 postoperative days) should be monitored for AF recurrences. We demonstrated that 67% of early-POAF patients also developed late POAF and that almost 80% of patients developed their first AF episode within the first postoperative month.[2] Therefore, the first postoperative month is a crucial period for strict rhythm monitoring in patients undergoing cardiac surgery. In addition to clinically available Holter electrogram monitoring, photoplethysmography recording, or handheld devices are promising tools for this purpose.

Secondly, it is unclear what duration of AF warrants initiation of lifelong anticoagulation. New-onset POAF after coronary artery bypass grafting has been identified as an independent predictor of stroke, myocardial infarction, and death during prolonged period of follow-up, and subclinical AF has been detected in 30% of patients with cryptogenic stroke. On the other hand, a recent study reported no significant risk reduction for stroke or systemic embolism in patients screened with an implantable loop recorder (ILR) as compared to usual care.[3] In this study, oral anticoagulant (OAC) was initiated in 29.7% of patients with ILR compared to 13.1% in the non-ILR group, suggesting that only clinically manifested AF, requires OAC. Accordingly, the ASSERT trial reported that only patients with longest episodes of subclinical AF (SCAF) (>24 h) had an increased risk of thromboembolic stroke as opposed to patients with shorter SCAF.[4] Nevertheless, silent stroke was not considered in these studies and others have demonstrated SCAF as an independent predictor of silent ischaemic brain lesions in patients without clinical AF.[5]

Notably, we also demonstrated that patients developing POAF had complex electrical conduction patterns during electrically induced AF. In addition, POAF patients had prolonged PR interval and enlarged right atrium, suggesting a more pronounced atrial structural remodelling as compared to patients without POAF, which may develop into a substrate for clinical AF. This is in line with previous studies demonstrating POAF as an independent predictor of clinical AF development.

In conclusion, continuous rhythm monitoring during the first postoperative month after cardiac surgery identifies many patients at risk of developing late POAF recurrences. However, the clinical impact of late POAF and subclinical AF in general population remains unclear. Circumstantial evidence suggests that longer episodes increase the risk of stroke, and POAF may also reflect early structural remodelling resulting in increased risk of AF development. Future studies should focus on the potential benefit of OAC in (silent) stroke prevention in subgroups of patients with late POAF and efforts should be undertaken to apply substrate modification and risk factor reduction in this potentially vulnerable population.

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