

Non-vitamin K oral anticoagulants in patients with atrial fibrillation after cardiac surgery: the results of the European Heart Rhythm Association Survey

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The purpose of this European Heart Rhythm Association survey was to assess the current practice concerning the use of oral anticoagulation in patients with post-operative atrial fibrillation (pre-existing or new-onset). The survey highlights the considerable heterogeneity of the type of anticoagulation, with 25% of the centres never using the non-vitamin K antagonist oral anticoagulants (NOACs) in this setting, as well the timing of oral anticoagulation initiation, the use and dosing of low-molecular-weight heparins, and the duration of anticoagulation when sinus rhythm is restored. One-third of the centres stated that they perceived that the risk of major pericardial bleeding requiring pericardiocentesis was higher when NOACs were used compared with vitamin K antagonists. Overall, the responding centres estimated the incidence of major pericardial haemorrhage to be 2.4%. More data are needed to inform practice guidelines in this field.

Keywords

Post-operative atrial fibrillation • Stroke prevention • Haemopericardium • Anticoagulation • Non-vitamin K antagonists oral anticoagulants • NOACs • Warfarin • Guidelines • EHRA survey • EP wire

Introduction

Atrial fibrillation (AF) and atrial flutter occur in one-third of the patients after cardiac surgery,^{1,2} most often within the first few days post-operatively.^{1,3} This is associated with longer hospital stay and worse long-term prognosis.^{3–5} There is an increased risk of peri-operative stroke, which can be potentially reduced by appropriate anticoagulation.⁶ However, anticoagulation in the post-operative period may also increase the risk of bleeding, particularly pericardial bleeding and cardiac tamponade.⁷

Non-vitamin K antagonist oral anticoagulants (NOACs) have emerged as an alternative to vitamin K antagonists (VKAs) for the prevention of thromboembolic events in patients with non-valvular AF.^{8–12} The European guidelines on the management of AF patients expressed a preference for NOACs over VKAs for stroke prevention, based on their overall clinical benefit in large prospective randomized trials.^{13,14} However, subjects with conditions associated with high risk of bleeding such as recent major surgery usually were excluded from these trials.^{8–12}

The purpose of this European Heart Rhythm Association (EHRA) survey was to assess the current practice in relation to the use of oral anticoagulation therapy in patients with post-operative AF.

Methods and results

Participating centres

The survey was based on an electronic questionnaire sent out to the EHRA Research Network centres. Responses were received from 16 centres in 14 countries. Of these, 78.3% were university hospitals, 13.4% private hospitals, and 8.7% other types of hospital.

During the last 6 months before the survey, 3 centres (18.8%) performed ≥ 500 cardiac surgical procedures, including isolated coronary artery bypass grafting, isolated non-mechanical valve surgery, or the combination of both. Six centres (37.5%) performed 250–500 procedures, 5 (31.25%) 100–250 procedures, and 2 centres (12.5%) performed < 100 procedures.

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Anticoagulation strategies in atrial fibrillation patients post-cardiac surgery

When using VKA for stroke prevention for post-operative AF and a CHA₂DS₂-VASc score of ≥ 2 , the majority of the 16 responding centres ($n = 13$, 81.3%) used a bridging scheme with low-molecular-weight heparin (LMWH). In 6 centres (37.5%), LMWH was given at a therapeutic dose, while in 7 (43.8%) of the centres a lower (venous thrombo prophylactic) dose was used (Figure 1A). The administration of VKA was started on Day 1 in 2 (12.5%) of the centres, between 24 h and Day 4 in 12 (75.0%), and beyond Day 5 in the remaining 2 (12.5%) of the centres (Figure 2A).

Most of the 16 responding centres ($n = 12$, 75.0%) used NOACs for post-operative AF in at least a proportion of their patients, although 4 (25.0%) centres reported that they had never used NOACs in this setting (Figure 1B).

Of 12 centres using NOACs, 6 (50%) initiated NOAC therapy within 48 h post-surgery, provided that the surgeon was satisfied with haemostasis (Figure 2B). In 2 (16.7%) centres, NOAC therapy was even started within 24 h post-cardiac surgery. Initial bridging with LMWH before starting NOACs was used in 3 (25.0%) of the 12 centres using NOAC (Figure 1B): these centres started NOAC on Day 2, on Day 3 or 4, and beyond Day 4 respectively.

Only 2 (12.5%) of the centres advised lifelong anticoagulation therapy in patients with new-onset post-operative AF and a single additional risk factor for stroke (i.e. with a CHA₂DS₂-VASc score of 1 in male or 2 in female patients). One centre reported initiating oral anticoagulation in these patients only if post-operative AF

continued for ≥ 1 week. While 4 (25.0%) of the centres have a policy to always discontinue oral anticoagulation 4 weeks after restoration of sinus rhythm, and one centre discontinues oral anticoagulation between 6 and 12 months, 7 (43.8%) of the centres only consider termination of anticoagulation provisionally after ≥ 1 month of persistence of sinus rhythm based on the absence of other stroke risk factors (e.g. spontaneous echo contrast, reduced left atrial function, or specific biomarkers).

Pericardial bleeding in patients on oral anticoagulants following cardiac surgery

Centres reported a wide variability in post-operative pericardial bleeding requiring pericardiocentesis or re-intervention, with estimates ranging from 0 up to 6.5% and an overall average reported incidence of 2.4%. One-third of the centres that use NOACs post-operatively stated that they perceived the risk of major pericardial bleeding requiring pericardiocentesis to be higher with NOACs compared with VKAs.

Discussion

This EHRA survey provides some insights into current European clinical practice and preferences regarding the use of oral anticoagulant therapy for stroke prevention in patients with a history of AF or new-onset AF following cardiac surgery (excluding mechanical heart valves). The same principles of thromboembolic risk assessment (i.e. based on the CHA₂DS₂-VASc score) are used as in other patients

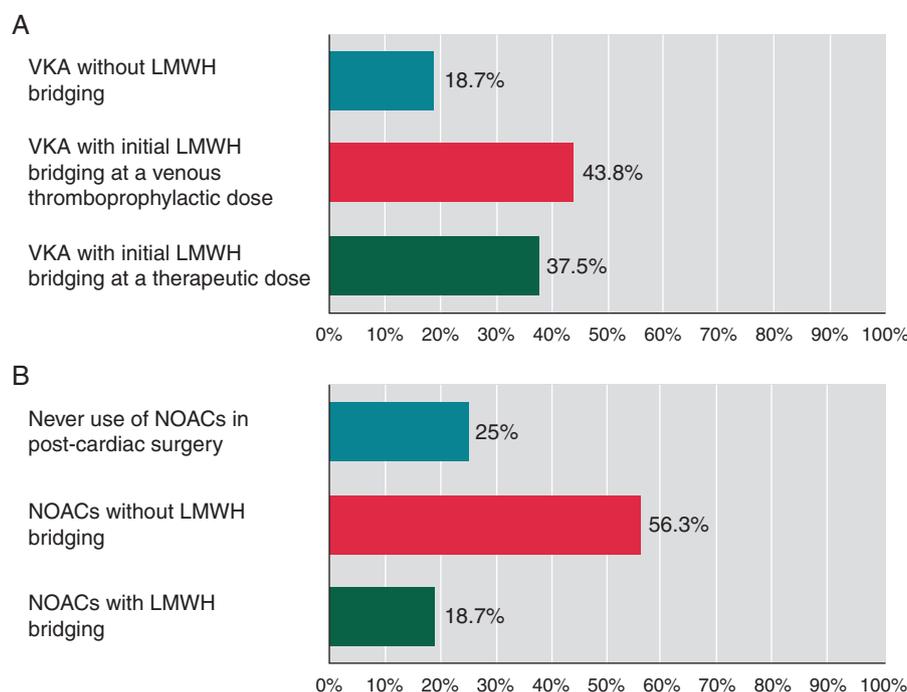
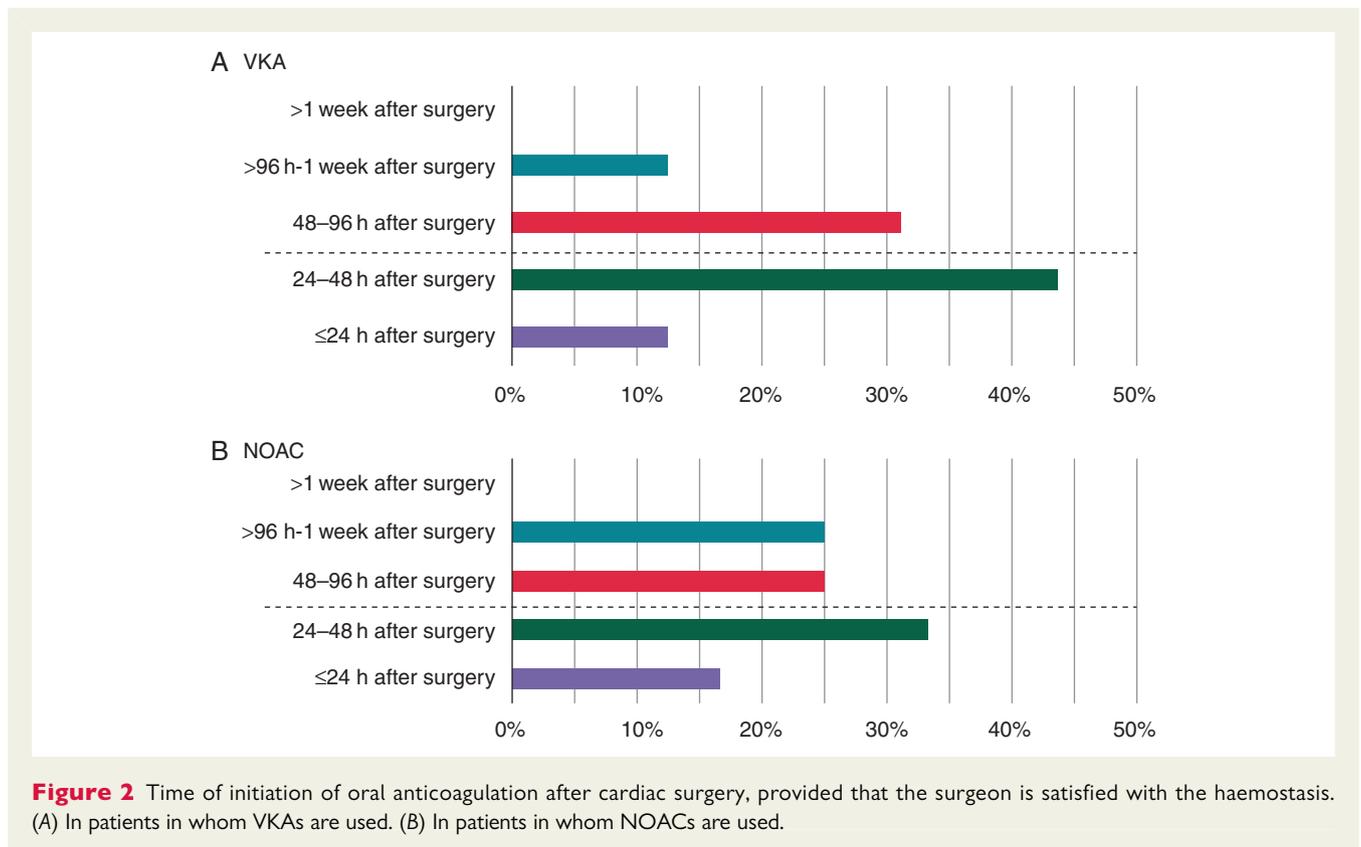


Figure 1 Types of oral anticoagulation in patients with a history of AF or new-onset post-operative AF with increased thromboembolic risk (i.e. CHA₂DS₂-VASc ≥ 2), excluding patients with mechanical heart valves. (A) Regimens of VKA use (used in all 16 responding centres). (B) Use of NOACs (in 12 of the 16 participating centres) and LMWH regimen in those. LMWH: low-molecular-weight heparin.



with AF. The current European Society of Cardiology guidelines for the management of AF do not provide specific recommendations on anticoagulation in this setting.¹³ The optimal post-operative antithrombotic treatment for AF patients is not guided by randomized controlled trials in general, and there is a lack of data concerning the use of NOACs in early post-operative AF in particular. This explains the very heterogeneous approach which was reported by the centres in this survey and calls for obtaining evidence in randomized controlled trials or large-scale registries. The European Observational Research Program (EORP) could address this gap.

The survey also aimed at assessment of the occurrence of major pericardial bleeding complications since some such concerns have been raised. Indeed, one quarter of the respondents reported that they did not use NOACs in the post-operative setting. As an inherent limitation of such surveys, we could not assess this perceived risk more precisely. It is unclear how far the provided estimates were based on data from institutional databases. From our own centres, we have found that adequate tracking of such events is suboptimal since post-operative patients can reside on surgical, intensive care, or cardiology wards (sometimes even in an off-site campus), hampering systematic and uniform post-operative follow-up. This emphasizes the need for prospective registries to address this question. From this survey, however, one can discern an overall more aggressive start of post-operative oral anticoagulation when NOACs are used, a factor which may have contributed to the bleeding rate: 50% of the centres started NOAC within 48 h after surgery, which was earlier than recommended in the guidelines⁸; VKA was started later than NOAC, despite its slower onset of action. Moreover, LMWH bridging in VKA patients was often performed at low

venous thromboprophylactic doses. Intriguingly, also a quarter of the NOAC centres used LMWH, even when NOACs were started between Days 2 and 4.

Prescribing oral anticoagulation and choosing the type of an anticoagulant (VKA or NOAC) are based on a risk–benefit analysis that may be different under different circumstances. Whereas there is overall net clinical benefit of NOACs compared with VKA in long-term treatment of AF patients, assessment of the risk–benefit analysis early after cardiac surgery requires more data.

Conclusions

This EP Wire highlights considerable uncertainty and hence, heterogeneity, within the medical community with regard to the optimal anticoagulation for AF following cardiac surgery. More data are needed, leading to updated and more precise practice guidelines. This could lead to a more uniform, safer, and more effective approach for post-operative patients than the empirical approach that is depicted in this survey.

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