New atrial fibrillation diagnosed perioperatively—anticoagulation practices in a secondary hospital
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ABSTRACT

BACKGROUND: Atrial fibrillation (AF) is a common arrhythmia encountered perioperatively in patients undergoing non-cardiac surgery. There is emerging evidence suggesting high risk of ischaemic stroke. There are no clear guidelines surrounding initiation of anticoagulation in this setting. This study evaluates current practice in anticoagulant management of new perioperative AF at Hutt Hospital.

METHODS: We have undertaken a retrospective study of 3,558 patients aged 60 years and over admitted for non-cardiac surgery at Hutt Hospital in 2014, to assess incidence of new AF/flutter and review how they were managed in regards to anticoagulation.

RESULTS: We identified 28 patients as having “new AF/flutter” with CHA2DS2-VASc scores between 1 and 8. Anticoagulation management was inconsistent, with only some patients receiving anticoagulation if using CHA2DS2-VASc score as a marker of indication for treatment.

CONCLUSIONS: There is insufficient evidence and lack of clear guidelines in this area to enable consistent and evidence-based management of patients with new AF identified perioperatively. Until such guidelines are available we suggest all such patients are individually assessed and treated depending on their individual risk/benefit analysis. Multiple factors such as bleeding risk, CHA2DS2-VASc score and perhaps duration of AF need to be considered.

Atrial fibrillation (AF) is a common arrhythmia affecting hospitalised patients, and associated with increased mortality and morbidity. It is the most common sustained tachyarrhythmia post-operatively. The global incidence of AF is estimated to be almost five million cases per year. It is uncommon before the age of 60 years, but the incidence increases with age, affecting almost 18% of patients older than 85 years. In addition to potentially troublesome symptoms, it also significantly increases an individual’s risk of ischaemic stroke. Atrial fibrillation-associated strokes have greater morbidity and mortality than other ischaemic strokes.

Clinicians are familiar with the increased risk of stroke in patients with known non-valvular AF and assess the need for anticoagulation with warfarin or a direct oral anticoagulant (DOAC) appropriately using risk stratification tools such as the CHA2DS2-VASc score. This calculates a risk score by allocating points for congestive heart failure, hypertension, age, diabetes mellitus, stroke/TIA/thromboembolism, vascular disease and sex. A score greater than 1 is considered high risk with an adjusted stroke rate between 2.2–15.2% per year. Anticoagulation is recommended for these patients, providing the individual risk/benefit analysis is favourable. Therapeutic anticoagulation significantly reduces the risk of ischaemic stroke in AF, but also increases the bleeding risk with associated morbidity and mortality. It is therefore very important to treat these patients appropriately, as there are significant risks associated with anticoagulation.
The indication for anticoagulation does not differ between patients with paroxysmal (pAF), persistent and permanent AF. However, the exact duration of AF required to increase stroke risk is unknown and literature on this is inconclusive. Most recent studies, mainly post hoc analysis of randomised controlled trials, suggests lesser risk of strokes in pAF compared to persistent or permanent AF, but the increased risk remains. A number of episodes of AF may also be subclinical, which clouds the picture and limits diagnosis or assessment of AF burden. What is also unknown is the risk related to an isolated episode of AF in the perioperative period of non-cardiac surgery. Previously this was considered a temporary event precipitated by multifactorial physiological stress such as catecholamine release, electrolyte disturbances, hypoxia or fluid shifts. Precipitating factors in non-cardiac surgical patients are similar to acutely unwell medical patients developing AF associated with acute illnesses. These patients are treated as any other patients with AF, but there is very limited literature in this area. A recent study by Gialdini et al (2014) revealed these patients may have a significantly increased stroke risk both long-term and short-term. In these patients undergoing non-cardiac surgery, the hazard ratio for stroke or thromboembolism at 12 months was 2.0 (95% CI 1.7–2.3) compared to those with no AF. This raises the question as to whether routine anticoagulation should be initiated as for patients with AF outside of the perioperative period. There may be significant bleeding risk with anticoagulation around the time of surgery, which is an additional consideration for these patients.

There are no clear or consistent guidelines from the expert bodies regarding management of new perioperative AF in non-cardiac surgery. The American College of Cardiology/American Heart Association/Heart Rhythm Society (ACC/AHA/HRS) guidelines released in 2014 state “Unless contraindicated, manage post-operative AF following non-cardiac surgery as for new-onset AF with any other precipitant” and anticoagulation should be used as appropriate in this setting. The European Society of Cardiology (ESC) do not specifically discuss perioperative AF in non-cardiac surgery, but do highlight the stroke risk and silent nature of AF, which may benefit from screening. The Cardiac Society of Australia and New Zealand (CSANZ) have no specific guidelines for these patients. A literature search failed to find any studies looking at anticoagulation practices of new perioperative AF in Australia or New Zealand.

As more and more elderly and high-risk patients are undergoing surgical procedures, the appropriate management of these patients is important to prevent future morbidity and mortality. Our aim was to assess how these patients are being managed currently, to see if there was consistent practice locally. Therefore, we undertook a retrospective study of surgical patients admitted to Hutt Hospital during a 12-month period between January and December 2014 to review the management of patients with new AF in regards to anticoagulation.

**Methods**

Hutt Hospital is a secondary hospital covering a population of 145,000 people in the greater Wellington region. There are 270 inpatient beds with surgical subspecialties in general, orthopaedic, plastic (tertiary level), gynaecological, ear nose and throat (ENT) and maxillofacial surgery. General medical, cardiology, intensive care and geriatric inpatient services are also on site. There is 24-hour acute cardiology and medical cover for the hospital. Hutt Hospital has a limited but dedicated perioperative medical and orthogeriatric service.

We identified all patients aged 60 years or greater admitted both acutely and electively under the surgical specialties between 1 January and 31 December 2014 using our electronic patient management system. We excluded any patients who did not undergo an operation or procedure in theatre.
We then screened eligible admissions using the ICD-10 diagnostic code I48 as a primary or secondary diagnosis for evidence of AF or atrial flutter at any time throughout the admission. Although atrial flutter is a different arrhythmia, we included it in the study as it can result in the same complications and is managed the same as AF in terms of anticoagulation. We ascertained if this was a new event or established condition by reviewing the electronic and paper medical records. If patients had multiple admissions during this time, we included the first admission documenting the presence of AF/flutter only.

We calculated the incidence of new and chronic AF/flutter and analysed patients with new AF/flutter further. We obtained demographic data and calculated their CHA2DS2-VASc score, although use of this risk stratifier has not been validated in perioperative patients. Our medical record system is not completely in electronic format and because of this we reviewed the hospital electronic and paper medical records, electronic discharge summary as well as the electronic record of primary care information pertaining to the time of admission and following 12 months to determine if these patients started anticoagulation. We reviewed any documented consultations or telephone advice between a medical and surgical team regarding management of the AF/flutter. We categorised patients into four groups in regards to anticoagulation; Not indicated, Contraindicated, Indicated and initiated or Indicated but not initiated.

We did not consider the acute perioperative bleeding risk, as it was assumed initiation of anticoagulation would be delayed until discharge or until it was considered safe to prescribe.

We used descriptive statistics to present our results. Formal statistical analysis was not possible due to the small sample size.

According to National Ethics Committee guidelines, this study was considered a quality improvement activity and therefore formal ethics approval was not required or requested. Clinical director of medicine authorised conduct of this study as an advanced trainee project for the Royal Australasian College of Physicians.

Results

Three thousand five hundred and fifty-eight surgical patients 60 years of age or above were admitted in 2014. Seventy-four were identified as having AF/flutter during their admission. One was excluded due to repeat admissions and one due to incorrect coding of ventricular tachycardia as AF. The 72 patients (2.02%) were included. Of these, 28 patients (39%) had ‘new AF/flutter’. We did not analyse those with known AF/flutter further.

The majority of patients who developed perioperative AF/flutter were admitted under general (11), followed by orthopaedic (9) and plastic surgery (8) services. None of the patients who underwent gynaecology, ENT or maxillofacial surgery developed perioperative AF/flutter. The mean age was 78 years, ranging from 64 to 93 years. No patients had pre-existing anticoagulation for alternative indications. Fifty-seven percent were admitted acutely. Fifty-seven percent of patients were female. The average length of stay was 10.9 days, ranging from one to 42 days. We were unable to determine the duration of AF/flutter due to inconsistent monitoring or documentation. It was generally detected on routine nursing observation or electrocardiogram, rather than continuous cardiac monitoring. It was not clearly documented if the AF persisted on discharge from hospital.

The average CHA2DS2-VASc score was 3.75, ranging from 1 to 8 (Figure 1). Fourteen patients (50%) had no score documented and four of the documented scores were incorrect. Two patients had no absolute indication for anticoagulation. One was due to a CHA2DS2-VASc score of 1 (intermediate risk) and the other died as an inpatient before this could be assessed. Possible contraindications were identified for eight patients, including metastatic cancer (4), high falls risk with multiple comorbidities (2), acute upper gastrointestinal bleed (1) and acute subdural haematoma (1).

Of those with an indication for anticoagulation, seven patients (39%) were anticoagulated. Three patients started anticoagulation while they were in hospital and four in the community within the following 12
months. The remaining 11 patients (61%) had no anticoagulation initiated, despite an indication according to their CHA\textsubscript{2}DS\textsubscript{2}-VASc score and without clear contraindications. The age of this patient group ranged from 66 to 81 years. The documented advice from medical specialties to the surgical teams admitting these patients is included in Table 1.

There was very inconsistent documentation on the electronic discharge summary regarding AF/flutter. Only 14 patients (50%) had AF/flutter as a diagnosis. However, all except three did mention AF/flutter in the body of text. Only 13 summaries (46%) clearly identified this as a new diagnosis.

Table 1: Advice given to patients in whom anticoagulation was indicated but not initiated.

<table>
<thead>
<tr>
<th>CHA\textsubscript{2}DS\textsubscript{2}-VASc Score</th>
<th>Service</th>
<th>Advice regarding anticoagulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>C</td>
<td>GP to start in the future</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>For aspirin as CHA\textsubscript{2}DS\textsubscript{2}-VASc score = 2</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>No need for anticoagulation as just started digoxin, but GP to reconsider if further episodes</td>
</tr>
<tr>
<td>3</td>
<td>U</td>
<td>For anticoagulation further down the line</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>GP to watch rhythm in the future</td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td>Start warfarin</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>Start anticoagulation</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Only anticoagulate if further episodes</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>Not a candidate for warfarin (no justification). Discharge summary states see GP regarding anticoagulation</td>
</tr>
<tr>
<td>5</td>
<td>M &amp; C</td>
<td>Anticoagulate when surgeons happy. Patient wishes to talk to GP first</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>As triggered by hernia, anticoagulation not required unless further episodes</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>If further AF, needs holter monitor to determine need for anticoagulation</td>
</tr>
<tr>
<td>3</td>
<td>O</td>
<td>Review anticoagulation in future, but likely aspirin only due to falls risk. CHA\textsubscript{2}DS\textsubscript{2}-VASc score not calculated, but incorrectly documented as “low”</td>
</tr>
</tbody>
</table>

C=Cardiology, M=General Medicine, O=Orthogeriatrics, U=Unclear who provided the advice.
Discussion

In this small study we have found no clear pattern in regards to anticoagulation management of new perioperative AF/flutter among patients undergoing non-cardiac surgery. The advice provided was varied, often vague and contradictory. This reflects the absence of clear guideline in this setting and poor adherence to guidance based on CHA\textsubscript{2}-DS\textsubscript{2}-VASc score and bleeding risk.

There is limited but emerging evidence that apparently isolated episodes of perioperative AF following non-cardiac surgery may increase the risk of ischaemic stroke and should possibly be managed as patients with chronic AF. According to our study we may potentially be undertreating these patients with 61% of patients not receiving anticoagulation despite an indication according to their CHA\textsubscript{2}-DS\textsubscript{2}-VASc score. This assumes that anticoagulation would reduce their risk of ischaemic stroke, as it does for other patients with AF. Different doctors and medical teams also offered mixed advice for the same patient. Until there is strong evidence, recommendation from cardiac societies or consensus-based guidelines, practice in this area is likely to remain varied. Due to varying opinions and approaches, it is challenging to formulate local protocols or guidelines to assist in management of these patients. However, current management of medical patients who develop AF while an inpatient could be considered as a way forward.

Documentation of consultations or telephone advice was often limited, with no mention of discussions with patients or risk/benefit analyses. The diagnosis of AF/flutter was only clear in 50% of discharge summaries, despite this being used as the main communication with the general practitioner (GP) who will be responsible for ongoing care. Despite the accepted validity and importance of the CHA\textsubscript{2}-DS\textsubscript{2}-VASc score as a risk stratifier for ischaemic stroke in AF, it was only recorded in 50% of cases. Again, this may reflect a lack of understanding of risks associated with AF among most junior medical staff completing discharge summaries, lesser attention to such problems from surgeons and lack of ownership of patients among physicians.

Adding to the confusion in the area is the current practice of bridging anticoagulation in patients with pre-existing AF. Recent guidelines for patients who are treated with warfarin and who are at low risk of thrombo-emboli or those who are back in normal sinus rhythm and are undergoing surgical or diagnostic procedures that carry a risk of bleeding, stopping warfarin for up to one week and allowing the INR to normalise without substituting unfractionated heparin is a recognised approach. It is probable that this thinking also may influence the use of anti-coagulation therapy in patients with new AF/flutter in the absence of clear guidance in this area. Even though new AF/flutter may carry a long-term thromboembolic risk, familial situation of ‘anticoagulation free’ perioperative period may distract prescribers, often junior house officers from taking a long-term view.

This study had a number of limitations, including the small sample size and retrospective nature. The relatively low incidence of AF/flutter (2.02%) in our cohort is likely an underestimation of the true incidence, as the majority of our patients did not receive routine cardiac monitoring. Detection of AF/flutter was primarily based on standard nursing observations only with further evaluation if an abnormal pulse was detected. Continuous cardiac monitoring or remote telemetry was occasionally utilised. We also relied on ICD-10 coding to identify these patients, which means any omissions by the coders would result in missed cases and a lower than expected incidence of new AF/flutter. This significantly limited our ability to assess this topic in detail or perform any statistical analysis. The lack of monitoring also limited information on the duration of AF/flutter. This was a major limitation, as many clinicians consider the duration of arrhythmia to be an important consideration when determining need for anticoagulation.

There were other limitations in that conversations regarding anticoagulation may have been had and appropriate decisions made, but not clearly documented in the notes or discharge summary. There may also have been contraindications that were not communicated on discharge. At times, patient management decisions...
were based on an experienced clinician's “gestalt”, which is difficult to ascertain from written notes. With regards to future anticoagulation plans, we relied on availability and accuracy of information on our electronic system. We did not access prescription records. This study also has some strengths. It confirms the confusion around management of patients with new perioperative AF/flutter with subsequent inconsistent practice and the need for more decision support tools. It also adds to the very limited literature in this area.

There is a need for larger studies to look into the thromboembolic risk associated with new perioperative AF/flutter and outcomes associated with anticoagulation so more robust evidence-based guidelines could be developed. In the absence of Australasian guidelines, we suggest patients with episodes of AF/flutter need to be assessed for stroke and bleeding risk. An individualised decision then needs to be made in regards to anticoagulation. This includes consideration of current bleeding risk in the perioperative period and possibly delaying initiation of anticoagulation. If there is uncertainty, the patient could be referred to the cardiology service for further evaluation and investigations to assist in risk stratification and decision making.

Conclusion

This study shows our current practice of managing new perioperative atrial fibrillation or flutter in non-cardiac surgery patients is inconsistent. This could have implications for the patients as they may have increased ischaemic stroke risk, as well as a potential financial burden from such an event. Until further evidence becomes available and formal guidelines are updated, we suggest all such patients are individually assessed and treated by balancing their individual risk and benefit of anticoagulation based on current treatment standards. Consideration of other factors such as the bleeding risk and duration of AF may also need to be considered.

Competing interests:
Nil.

Acknowledgements:
Sharon Morse, Data Analyst, Business Information, Hutt Valley District Health Board; Michele Paku, Manager Clinical Records, Clinical Coding, Admin Relief Clerks, Central Typing Services, Hutt Valley District Health Board; Consultant Cardiologists and Electrophysiologists, Hutt and Wellington Regional Hospitals.

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