VIA MEDICA
EDITORIAL
2014, Vol. 21, No. 5, 451–453
DOI: 10.5603/CJ.2014.0075

ISSN 1897–5593

Post myocardial infarction and atrial fibrillation: Thromboprophylaxis and risk stratification using the CHA_2DS_2-VASc score

Yee Cheng Lau[1], Gregory Y.H. Lip[1, 2]

[1]University of Birmingham Centre for Cardiovascular Sciences, City Hospital, Birmingham, United Kingdom
[2]Thrombosis Research Unit, Department of Clinical Medicine, University, Aalborg, Denmark

Articles p. 465 and p. 474

Oral anticoagulation (OAC) therapy has long been proven to be an effective treatment in atrial fibrillation (AF) to prevent ischemic stroke and systemic thromboembolism. The clinical effectiveness of OAC (such as vitamin K antagonist [VKA]) far exceeds that of the antiplatelet agents, and with the advent of non-vitamin K oral anticoagulants (NOACs), the propensity to cause harm by treatment-related hemorrhage is reduced. Nevertheless, as a third of AF patients may also suffer from significant coronary artery disease [1], the use of aspirin and ADP-receptor ($P2Y_{12}$) antagonists in combination with OAC is indicated after acute coronary syndrome (ACS) or revascularization treatment with coronary angioplasty and stent implantation.

This creates a therapeutic dilemma amongst clinicians as extended period of combination treatment of any OAC plus antiplatelets in AF patient post-acute coronary events or coronary stent implantation would expose the patients to increased bleeding risk and even fatal bleeds [2–5]. Indeed, we are trying to juggle four balls in the air in this situation: preventing stroke related to AF, minimize recurrent cardiac ischemia, avoid stent thrombosis and the risk of serious bleeding.

Several international consensuses and recommendations have provided guidance regarding the duration and intensity of antiplatelet and anticoagulation treatment [1, 6, 7]. Decision making largely depends on patient's individual hemorrhagic risk, nature and type of stent implanted. With better stent technology, there is even a move towards shorter periods requiring post-stent implantation of dual antiplatelet drugs. However, there is little information regarding adherence to guidelines and resultant clinical outcomes in AF patients. Furthermore, there is even less research upon prediction of "new-AF" occurrence in patients who are post ACS.

In the current issue of "Cardiology Journal", two articles are of interest. First, Maier et al. [8] used the Berlin metropolitan registries to investigate the use of antiplatelet agents and OAC amongst AF patients who have experienced ACS. The second article by Lau et al. [9] utilized a Hong Kong registry to investigate the possibility of using $CHADS_2$ and CHA_2DS_2-VASc score to predict new-onset AF among ST elevation myocardial infarction (STEMI) survivors.

In the first article, Meier et al. [8] utilized "real-world" data from the Berlin AFibACS Registry to identify over a 46-month period 1,295 AF patients who had suffered ACS, of which > 99% possessed significant stroke risk (CHA_2DS_2-VASc score > 1). Out of these, 888 (68.6%) AF-ACS patients had stent implantation, 7% only with balloon angioplasty, and the rest treated conservatively. Amongst the patients who had undergone stent implantation, almost 60% received bare metal stent (BMS) and the rest received drug-eluting stents (DES). Unsurprisingly, the initial inpatient results demonstrated no statistical difference in major or minor bleeding risk by GUSTO criteria when comparing patients receiving DES or BMS. Inpatient outcomes nonetheless reveal significantly higher mortality among patients treated conservatively and with plain-old balloon angioplasty only as compared to those receiving coronary stents.

Address for correspondence: Prof. Gregory Y.H. Lip, University of Birmingham Centre for Cardiovascular Sciences, City Hospital, Birmingham, United Kingdom, tel: +44 121 507 5080, fax: +44 121 554 4083, e-mail: g.y.h.lip@bham.ac.uk

A few points merit comment. When reviewing the discharge medications, it is apparent that despite majority of AF-ACS patients receiving dual antiplatelet treatment, over 50% of patients who have received coronary stents were discharged without effective anticoagulation treatment. Among those receiving triple therapy (dual antiplatelets and anticoagulation agents), only over half were receiving OAC, while the rest received sub-cutaneous heparin. There was a tiny number of patients (2%) receiving NOACs in the form of dabigatran. Logistic regression analysis did reveal that increasing CHA_2DS_2-VASc score as an important factor for triple therapy, and gradual improvement of the prescription rate of triple therapy over time.

Despite various guidelines, the results from Meier et al. [8] highlight the lack of coherent management strategies among clinicians for AF patients who had received revascularization therapy for ACS. This may indicate persistent gaps in awareness among clinicians concerning management of ACS in AF patients, or the aversion of anticoagulation use due to perception of bleeding risk among this patient group who are usually older and generally frailer.

These data are in perspective to a recent retrospective analysis by Bernard et al. [10] which demonstrated that the lack of OAC at discharge (for patients undergoing coronary stent implantation) is independently associated with over 2-fold increase in risk of death, stroke and systemic thromboembolism. Other large registry data, such as those from Lamberts et al. [11] clearly show that combination treatment of OAC and antiplatelet agent is needed to ensure better clinical outcomes. On the other hand, regarding the use of dual or triple therapy debate, some data suggest that dual therapy using OAC with clopidogrel may be just as efficacious as triple therapy, but results in lower bleeding risks [12]. The choice of using NOAC as an effective OAC remains contentious as there is no prospective trial evidence thus far to support its use in this particular patient group.

What about the development of new onset AF post-ACS? In the second article, Lau et al. [9] utilized a Hong Kong local cardiac registry to follow 607 consecutive STEMI survivors, who had no known prior AF, for a period of 63 months, with the aim of identifying new-onset AF or stroke in this patient group. With this approach, 83 new-onset AF and 29 ischemic strokes were noted during the follow-up period.

Subsequent analysis of patient demographics comparing new-AF with those without showed that the AF-STEMI subgroup was generally more likely to be elderly, female and had worse cardiac function, with a lower ejection fraction, and higher prevalence of heart failure. Perhaps unsurprisingly, these findings have confirmed the association between age and AF, but also the pathophysiological relationship between AF and heart failure [13]. In this instance, the propensity of developing AF was amplified by the acute coronary event (i.e. STEMI). The latter may have resulted in neurohumoral activation, precipitating catecholamine release and tachycardia, interstitial fibrosis and/or dysregulation of intra-cellular calcium. Indeed, better prescription of beta-blockers (rate-limiting) and statins (fibrosis or inflammation reducing) could have a seemingly protective effect in the non-AF group.

More importantly, Lau et al. [9] demonstrated that those with new-onset AF are more likely to have higher pre-event $CHADS_2$ and CHA_2DS_2-VASc scores. Both $CHADS_2$ and CHA_2DS_2-VASc scores predicted a greater incidence of AF, with a c-statistics of 0.632 and 0.676, respectively. However, the sensitivity and specificity of both scoring systems to detect AF are only modest at best. Those STEMI survivors who developed new ischemic stroke had higher $CHADS_2$ and CHA_2DS_2-VASc scores.

The findings from Lau et al. [9] have highlighted the increased prevalence of AF and ischemic stroke among post-STEMI survivors, and emphasized the need for greater vigilance and better surveillance for new onset AF among this at-risk patient group. Nonetheless, once AF has been detected, the shift should be to identify those who will not benefit from OAC and after individualized stratification of bleeding risk, offer the most appropriate antithrombotic treatment to the rest [14].

In conclusion, we can appreciate that although the treatment of AF patients suffering from acute ACS is improving, the use of OAC remains suboptimal. A greater emphasis on the use of appropriate OAC would help prevent death and reduce thromboembolic risk. This is further emphasized by the findings from Lau et al. [9], demonstrating the increased incidence of AF and stroke among STEMI survivors. The two articles in this journal also highlight the need for more trials related to the use of dual or triple therapy in the prevention of ischemic stroke in AF patients receiving coronary stents, as well as the intensity of surveillance in post ACS patients to detect new-onset AF.

Conflict of interest: Y.C. Lau — none declared; G.Y.H. Lip has served as a consultant for Bayer, Astellas, Merck, Sanofi, BMS/Pfizer, Biotronik,

Medtronic, Portola, Boehringer Ingelheim, Microlife and Daiichi-Sankyo and has been on the speaker's bureau for Bayer, BMS/Pfizer, Medtronic, Boehringer Ingelheim, Microlife and Daiichi-Sankyo.

References

1. Lip GY, Huber K, Andreotti F et al. Management of antithrombotic therapy in atrial fibrillation patients presenting with acute coronary syndrome and/or undergoing percutaneous coronary intervention/stenting. Thrombosis Haemostasis, 2010; 103: 13–28.
2. Hansen ML, Sorensen R, Clausen MT et al. Risk of bleeding with single, dual, or triple therapy with warfarin, aspirin, and clopidogrel in patients with atrial fibrillation. Arch Internal Med, 2010; 170: 1433–1441.
3. Karjalainen PP, Porela P, Ylitalo A et al. Safety and efficacy of combined antiplatelet-warfarin therapy after coronary stenting. Eur Heart J, 2007; 28: 726–732.
4. Azoulay L, Dell'Aniello S, Simon T, Renoux C, Suissa S. The concurrent use of antithrombotic therapies and the risk of bleeding in patients with atrial fibrillation. Thrombosis Haemostasis, 2013; 109: 431–439.
5. Ruiz-Nodar JM, Marin F. Antithrombotic therapy and bleeding risk in atrial fibrillation. Fewer unanswered questions. Thrombosis Haemostasis, 2013; 109: 363–365.
6. De Caterina R, Husted S, Wallentin L et al. Vitamin K antagonists in heart disease: current status and perspectives (Section III). Position paper of the ESC Working Group on Thrombosis-Task Force on Anticoagulants in Heart Disease. Thrombosis Haemostasis, 2013; 110: 1087–1107.
7. De Caterina R, Husted S, Wallentin L et al. Parenteral anticoagulants in heart disease: current status and perspectives (Section II). Position paper of the ESC Working Group on Thrombosis-Task Force on Anticoagulants in Heart Disease. Thrombosis Haemostasis, 2013; 109: 769–786.
8. Lau K-K, Chan P-H, Yiu K-H et al. Roles of the $CHADS_2$ and CHA_2DS_2-VASc scores in post-myocardial infarction patients: Risk of new occurrence of atrial fibrillation and ischemic stroke. Cardiol J, 2014; 21: 474–483.
9. Maier B, Hegenbarth C, Theres H, Schoeller R, Schuehlen H, Behrens S; for the AFibACS Registry. Antithrombotic therapy in patients with atrial fibrillation and acute coronary syndrome in the real world: Data from the Berlin AFibACS Registry. Cardiol J, 2014; 21: 465–473.
10. Bernard A, Fauchier L, Pellegrin C et al. Anticoagulation in patients with atrial fibrillation undergoing coronary stent implantation. Thrombosis Haemostasis, 2013; 110: 560–568.
11. Lamberts M, Gislason GH, Olesen JB et al. Oral anticoagulation and antiplatelets in atrial fibrillation patients after myocardial infarction and coronary intervention. J Am Coll Cardiol, 2013; 62: 981–989.
12. Dewilde WJ, Oirbans T, Verheugt FW et al. Use of clopidogrel with or without aspirin in patients taking oral anticoagulant therapy and undergoing percutaneous coronary intervention: An open-label, randomised, controlled trial. Lancet, 2013; 381: 1107–1115.
13. Anter E, Jessup M, Callans DJ. Atrial fibrillation and heart failure: Treatment considerations for a dual epidemic. Circulation, 2009; 119: 2516–2525.
14. Olesen JB, Torp-Pedersen C, Hansen ML, Lip GY. The value of the CHA2DS2-VASc score for refining stroke risk stratification in patients with atrial fibrillation with a CHADS2 score 0-1: a nationwide cohort study. Thrombosis Haemostasis, 2012; 107: 1172–1179.