The assessment of thromboembolic risk in patients with atrial fibrillation (AF) is recommended before initiation of oral anticoagulation (OAC). Current guidelines recommend that in patients with one or more stroke risk factors (eg, a CHA₂DS₂-VASc score [congestive heart failure, hypertension, age ≥75 years, diabetes, history of previous stroke, vascular disease, age 65–74 years, and sex category [female]) ≥1, OAC is recommended. Nonetheless, stroke risk is closely related to bleeding risk in patients with AF.2,3

**Methods and Results**—We studied 590 consecutive patients with atrial fibrillation undergoing percutaneous coronary intervention/stenting and CHA₂DS₂-VASc score >1 (ie, OAC recommended). We compared patients with low-intermediate bleeding risk (HAS-BLED 0–2) and high risk (HAS-BLED ≥3), the relation between CHA₂DS₂-VASc and HAS-BLED, and the benefit and risks of the use of OAC in patients with high bleeding risk. The development of any bleeding episode, thromboembolism, mortality, cardiac events, and the composite major adverse cardiac events (ie, death, acute myocardial infarction, and/or target lesion revascularization) end point was recorded as well as the composite major adverse events (ie, major adverse cardiac events, major bleeding, or thromboembolism) end point at 1-year follow-up. Of the study cohort, 420 (71%) had a HAS-BLED score ≥3, and patients who were on OAC at discharge had lower mortality rate (9.3% versus 20.1%; \(P<0.01\)) and major adverse cardiac events (13.0% versus 26.4%; \(P<0.01\)) but with a similar major adverse event (20.5% versus 27.6%; \(P=0.11\)) and higher major bleeding rate (11.8% versus 4.0%; \(P<0.01\)). Predictors of major bleeding were chronic renal failure and the use of drug-eluting stents (both \(P<0.05\)).

**Conclusions**—Most patients with atrial fibrillation undergoing percutaneous coronary intervention/stenting have a high risk for major bleeding (HAS-BLED score ≥3). Even in these patients, OAC improves prognosis in these patients (reduced mortality and major adverse cardiac events) with an increase in major bleeding. (Circ Cardiovasc Interv. 2012;5:459-466.)

**Key Words:** atrial fibrillation ▪ bleeding risk ▪ oral anticoagulation ▪ stent implantation

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**Stent Outcomes**

**Should We Recommend Oral Anticoagulation Therapy in Patients With Atrial Fibrillation Undergoing Coronary Artery Stenting With a High HAS-BLED Bleeding Risk Score?**

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**Background**—Recent European guidelines for the management of atrial fibrillation recommend oral anticoagulation (OAC) in patients with CHA₂DS₂-VASc score (congestive heart failure, hypertension, age ≥75 years, diabetes, history of previous stroke, vascular disease, age 65–74 years, and sex category [female]) ≥1. The HAS-BLED score (Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile international normalized ratio, Elderly [≥65 years], Drugs/alcohol concomitantly) has been suggested to assess bleeding risk in patients with atrial fibrillation (score ≥3 indicates high risk of bleeding). Despite the guidelines, this approach has never been tested in a cohort of patients with atrial fibrillation undergoing percutaneous coronary intervention with stent implantation.

**Methods and Results**—We studied 590 consecutive patients with atrial fibrillation undergoing percutaneous coronary intervention/stenting and CHA₂DS₂-VASc score >1 (ie, OAC recommended). We compared patients with low-intermediate bleeding risk (HAS-BLED 0–2) and high risk (HAS-BLED ≥3), the relation between CHA₂DS₂-VASc and HAS-BLED, and the benefit and risks of the use of OAC in patients with high bleeding risk. The development of any bleeding episode, thromboembolism, mortality, cardiac events, and the composite major adverse cardiac events (ie, death, acute myocardial infarction, and/or target lesion revascularization) end point was recorded as well as the composite major adverse events (ie, major adverse cardiac events, major bleeding, or thromboembolism) end point at 1-year follow-up. Of the study cohort, 420 (71%) had a HAS-BLED score ≥3, and patients who were on OAC at discharge had lower mortality rate (9.3% versus 20.1%; \(P<0.01\)) and major adverse cardiac events (13.0% versus 26.4%; \(P<0.01\)) but with a similar major adverse event (20.5% versus 27.6%; \(P=0.11\)) and higher major bleeding rate (11.8% versus 4.0%; \(P<0.01\)). Predictors of major bleeding were chronic renal failure and the use of drug-eluting stents (both \(P<0.05\)).

**Conclusions**—Most patients with atrial fibrillation undergoing percutaneous coronary intervention/stenting have a high risk for major bleeding (HAS-BLED score ≥3). Even in these patients, OAC improves prognosis in these patients (reduced mortality and major adverse cardiac events) with an increase in major bleeding. (Circ Cardiovasc Interv. 2012;5:459-466.)

**Key Words:** atrial fibrillation ▪ bleeding risk ▪ oral anticoagulation ▪ stent implantation
Guidelines on the management on AF recommend the assessment of bleeding risk in patients before prescribing antithrombotic therapy using the HAS-BLED score.

Patients with AF with an acute coronary syndrome and/or undergoing PCI represent a high-risk population.

The “net clinical benefit” of triple therapy in patients with AF undergoing coronary artery stenting with high HAS-BLED score (ie, high risk of bleeding) is unknown.

WHAT THE STUDY ADDS

Most patients with AF undergoing coronary stenting are at high risk for major bleeding (HAS-BLED score ≥3).

In patients with high HAS-BLED score (≥3), the nonuse of oral anticoagulation, age, and heart failure were the only independent predictors of death in the first year.

Even in these patients, oral anticoagulation improves prognosis but with an increase in major bleeding; thus, management decisions in these high-risk patients should be individualized.

The 2010 European Society of Cardiology (ESC) and the 2011 Canadian guidelines on the management on AF recommended the assessment of bleeding risk in patients before prescribing antithrombotic therapy using the HAS-BLED score (Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile international normalized ratio, Elderly [>65 years], Drugs/alcohol concomitantly).1,4,5 The HAS-BLED score has also recently been validated in independent large populations from a clinical trial and a nationwide cohort study,7 showing similar (or sometimes superior) prediction of bleeding compared with other bleeding scores with the advantage of simplicity and ease of use.5 Indeed, the HAS-BLED bleeding risk score has been proposed as a practical tool to assess the individual bleeding risk on patients with “real-world” AF, potentially supporting clinical decision-making regarding antithrombotic therapy in patients with AF,1,4 whereby a score of ≥3 indicates “high risk,” and some caution and regular review is needed.1

A particularly interesting group of patients that represents a complex management problem are those patients with AF presenting with an acute coronary syndrome and/or those undergoing percutaneous coronary intervention (PCI)/stenting.2,10 Such patients represent a high-risk population with a bad prognosis.11 The recent Consensus Document by the ESC Working Group on Thrombosis, endorsed by the European Heart Rhythm Association and the European Association of Percutaneous Cardiovascular Intervention suggests that in patients with AF presenting with acute coronary syndrome and/or undergoing stenting, triple therapy (OAC, aspirin, and clopidogrel) should be used in the short term followed by longer therapy with OAC plus a single antiplatelet drug.10 However, the use of triple therapy is associated with a higher bleeding rate,12 and thus, the use of drug-eluting stents is discouraged so that the duration of triple therapy is shortened.10,12,13 Of note, the European consensus document,7 which also included a systematic review that informed the ESC guidelines,1 recommended a treatment approach based on type of stent, acute or elective presentation, and the patient’s bleeding risk. Evaluation of the latter was based on the HAS-BLED score, but this management approach has never been previously investigated in any AF patient cohort undergoing PCI/stenting. Thus, the predictive value of the HAS-BLED score for bleeding risk and prognosis in patients with AF treated with stenting remains unknown. Also, the CHA2DS2-VASc score for embolic risk has not previously been tested in this population. Indeed, it would be important to know the “net clinical benefit” of using OAC (and triple therapy in the patients with acute coronary syndrome), balancing the impact on cardiovascular events against the risk of bleeding.14

The aims of our study were to determine the use of the HAS-BLED score and to assess the relation between the CHA2DS2-VASc and HAS-BLED scores in patients with AF undergoing PCI/stenting. We also determined the benefits and risks of the use of OAC in patients with high bleeding risk, that is, those with a HAS-BLED score ≥3.

Methods

We reviewed our prospectively completed database of 604 consecutive patients with AF treated with at least one stent15 over a 7-year period (January 2001 to March 2008) with a CHA2DS2-VASc score >1 (and hence, OAC is recommended). The risk of thromboembolism was evaluated using the CHA2DS2-VASc score16 and the bleeding risk with the HAS-BLED score.5 The CHA2DS2-VASc stroke risk score assigns 1 point to congestive heart failure, hypertension, diabetes, vascular disease, age 65 to 74 years, and sex category (female) and 2 points to age ≥75 years and history of previous stroke. The HAS-BLED score is the result from adding 1 point to hypertension, abnormal renal/liver function (1 point for each one), stroke, bleeding history or predisposition, labile international normalized ratio, elderly (>65 years), and drugs/alcohol concomitantly (1 point for each one). All of the outcome data were collected post hoc.

Decisions concerning management of the patient such as type of revascularization performed and type of stent, etc, were taken by the interventional cardiologist and/or clinical cardiologist responsible for the patient based on risk factors for stroke/thromboembolism, revascularization performed, type of stents implanted, and risk of bleeding. The anticoagulation and/or antiplatelet therapy regimen on discharge was also decided by the clinical cardiologist based on risk factors for thromboembolism, risk of bleeding, comorbidity, revascularization performed, and type of stents implanted.

We analyzed clinical and demographic characteristics, risk factors for thromboembolism, and the use of antithrombotic therapy before coronary stenting and at discharge. After discharge, patients were followed up as part of the routine clinical practice of each hospital. An exhaustive review of follow-up medical data was performed. Follow-up at 1 year was also done by telephone to confirm the medication patients were taking and hemorrhagic, thromboembolic, and cardiac episodes were analyzed. Clinical records of patients with hospital readmissions and/or outpatient clinic interviews were also reviewed for further information to validate information in our registry database.
End Point Definitions
We analyzed the events during the first year after PCI for 2 reasons: first, because it is the period with higher bleeding risk due to the use of dual antiplatelet medications often added to OAC; and second, this is the period in which the risk–benefit balance between major bleeding risk and major cardiovascular events seems to be of most interest. We compared patients with low to intermediate bleeding risk (HAS-BLED: 0–2) versus high risk (HAS-BLED ≥3; these “cutoff” values defined in the European consensus document and the ESC guidelines'), the relation between the CHA2DS2-VASc and HAS-BLED scores, and finally, the benefits and risks of the use of OAC in patients with high bleeding risk.

The primary end point was defined as the occurrence of any cause of death. Secondary end points were the development of any major bleeding episode, thromboembolism, cardiac events, and the composite endpoints of major adverse cardiac events (MACEs: death, acute myocardial infarction, or target vessel failure), and major adverse events (MAEs; MACE, major bleeding, or thromboembolism).

Myocardial infarction was defined as either the development of pathological Q waves in at least 2 contiguous leads with an elevated creatine kinase MB fraction level or—in the absence of pathological Q waves—an elevation in creatine kinase MB levels to more than twice the upper limit of normal. Major bleeding was defined as a decrease in the blood hemoglobin level of ≥5.0 g/dL (including the need for a transfusion of ≥2 units of blood, the need for corrective surgery, the occurrence of an intracranial or retroperitoneal hemorrhage, or any combination of these events). In addition, all readmissions to hospital were carefully reviewed to obtain the maximum information on any possible events and to validate our own database.

Statistical Analysis
The normal distributed continuous variables are shown as mean ±SD. Discrete variables are presented as frequencies (percentages). The comparison of discrete variables was done through the χ² test or the Fisher exact test. Comparisons of the groups for continuous variables were performed with the unpaired t test for independent samples or the Mann-Whitney U test (when continuous variable was not normally distributed). To determine the influence of OAC at discharge in high-risk bleeding patients, survival analyses were initially conducted using a Kaplan-Meier analysis and compared by the log-rank test. The number needed to treat was calculated. Second, we performed a stepwise Cox proportional hazard model analysis considering the presence of any event as end point and introducing influencing variables. In the multivariate model, we also included those variables that showed a probability value <0.15 in the univariate analysis when comparing patient with and without oral anticoagulation at discharge as well as all demographic, clinical, or procedural variables that were potentially not well balanced (ie, P<0.15 for comparison of means). All probability values were 2-sided, and a probability value of <0.05 was considered as statistically significant.

Results
Of our cohort of 604 patients with AF and PCI/stenting, 590 (97.7%) had a CHA2DS2-VASc score >1 and would have been recommended OAC. Of these 590 patients, 420 (71.2%) showed a HAS-BLED score ≥3 (ie, high risk of bleeding), 142 (24.1%) had a HAS-BLED score 2 (moderate risk), and only 28 (4.7%) had a HAS-BLED score 1 (low risk; Table 1). In the whole cohort, 56% were on OAC with no significant outcome differences at the time of actual PCI per se compared with non-OAC users (data not shown).

There was a modest but statistically significant correlation between the CHA2DS2-VASc and HAS-BLED scores (Spearman rank correlation r=0.60; P<0.01). Patients with a HAS-BLED ≥3 were a higher risk population (Table 1) than the population with HAS-BLED 0 to 2 with an increased prevalence of stroke risk factors but with similar presentation of coronary artery disease with regard to clinical features such as indication for cardiac catheterization, multivessel disease, and completeness of revascularization. In patients with a HAS-BLED ≥3, event rates were much higher with mortality rate at 1 year of 14.1%, a MACE rate of 18.9%, and MAE rate of 23.7% (Table 2).

Relation of CHA2DS2-VASc and HAS-BLED Scores to Prognosis
In the univariate Cox analysis, the CHA2DS2-VASc score was associated with death (hazard ratio [HR], 1.29; 95% CI, 1.09–1.52; P<0.01) and MACE (HR, 1.26; 95% CI, 1.09–1.45; P<0.01) but not major bleeding episodes (HR, 1.14; 95% CI, 0.95–1.46; P=0.14). The HAS-BLED score was associated with death (HR, 1.65; 95% CI, 1.22–2.23; P<0.01), major bleeding episodes (HR, 1.64; 95% CI, 1.11–2.42; P=0.01), and MACE (HR, 1.62; 95% CI, 1.25–2.11; P<0.01; note: the HR reports the risk associated with a 1-point increase in the scores). Figure 1 shows the relation of CHA2DS2-VASc and HAS-BLED scores to major outcome events.

Oral Anticoagulation and Bleeding Risk
Of the patients at low to moderate bleeding risk (HAS-BLED 0–2; n=170 [28.8%]), only 54.1% were anticoagulated. The overall mortality rate in this group at 1 year was 7.3% with a MACE rate of 8.8%. The rate of major bleeding during the first year was 5.7% overall (7.8% in anticoagulated patients versus 1.6% in nonanticoagulated; P=0.13).

Of the patients at high bleeding risk (HAS-BLED ≥3; n=420 [71.2%]), only 57.1% were anticoagulated at discharge (Figure 2). The subgroup taking OAC at discharge was associated with a lower rate of death (9.3% versus 20.1%; HR, 0.45; CI, 0.26–0.78; P<0.01) and MACE (13.0% versus 26.4%; HR, 0.48; CI, 0.29–0.77; P<0.01). The incidence of major bleeding was also significantly increased in anticoagulated patients (11.8% versus 4.0%; HR, 3.03; CI, 1.24–7.38; P=0.01). The combined MAE end point was lower in the anticoagulated group but not statistically significant (20.5% versus 27.6%; HR, 0.75; CI, 0.49–1.13; P=0.11).

In the multivariate analysis, OAC was significantly associated with lower mortality (HR, 0.20; 95% CI, 0.06–0.64; P<0.01), MACE events (HR, 0.21; 95% CI, 0.08–0.57; P<0.01), and MAE events (HR, 0.39; 95% CI, 0.16–0.92; P=0.03) without a significant increase in major bleeding (HR, 2.31; 95% CI, 0.55–9.71; P=0.25; Table 3). In this group, predictors of MACE were age (P<0.01) and congestive heart failure (P=0.03), showing the OAC at discharge having a protective effect (P<0.01). Predictors of major bleeding were chronic renal failure (P<0.01) and the use of drug-eluting stents (P=0.04). In the overall population, the crude number needed to treat for avoiding a MACE was 6.7, whereas the crude number needed to harm to produce a major bleeding complication with oral anticoagulation was 12.3, consistent with the very high risk nature of the study cohort as a whole.
Discussion

The present study has evaluated for the first time whether the management strategy proposed by the 2010 ESC guidelines on patients with AF undergoing PCI/stenting was useful in “real-life” clinical practice. We show that OAC use at discharge (as part of combination therapy with antiplatelet therapy) had a significantly lower mortality and MACE but a similar MAE and higher major bleeding rate. In addition, we show that among patients at high bleeding risk (HAS-BLED ≥3), OAC at discharge was associated with a reduced rate of death and MACE, although major bleeding was increased. Thus, the use of both risk scores, CHA2DS2-VASc and HAS-BLED, also allows us to stratify the risk of death and major cardiac events in patients with AF who undergo coronary stenting, identifying those patients at risk of worse prognosis.

Stroke and bleeding risk were correlated closely with each other, as reflected by the significant linear correlation between the CHA2DS2-VASc and the HAS-BLED scores. Nonetheless, we show that even in those patients at high bleeding risk, OAC would probably provide some advantage given that the absolute reduction in cardiovascular events (death and MACE) at the time of being on OAC (P=0.01) but this benefit was offset by including hemorrhagic events and lost its statistical significance in the MAE combined end point after MAE; 20.5% versus 27.6%; P=0.11). Indeed, this raises the issue of whether components of the composite end point should carry equal weight (ie, death versus MACE versus major bleeding) in relation to the patient per se.

In patients with high HAS-BLED score (≥3), the nonuse of OAC, age, and heart failure were the only independent
predictors of death in the first year. Logically, this approach with the HAS-BLED score should help us emphasize the precautions needed in regular review and close follow-up of these patients. Indeed, the HAS-BLED score also makes clinicians think about correctable common risk factors for bleeding, for example, uncontrolled blood pressure, labile international normalized ratios (if on warfarin), etc, which if corrected, would reduce the HAS-BLED score and bleeding risk per se.

Patients with AF treated with stenting benefit overall by the use of OAC\textsuperscript{11} and as the present analysis shows, the subgroup at higher bleeding risk would benefit even more. This confirms previous observations by Olesen et al.,\textsuperscript{14} which showed that the “net clinical benefit” of OAC by balancing ischemic stroke against intracranial hemorrhage was greater in those with a HAS-BLED score $\geq 3$ given that the absolute benefit of ischemic stroke reduction would outweigh the small increase in bleeding.

Currently, there are at least 3 ongoing trials (ISAR-TRIPLE [Triple Therapy in Patients on Oral Anticoagulation After Drug Eluting Stent Implantation] NCT00776633; WOEST [What is the Optimal antiplatelet and anticoagulant therapy in patients with oral anticoagulation and coronary Stenting] NCT00769938; MUSICA-2 [Anticoagulation in Stent Intervention] NCT01141153) evaluating different OAC strategies in patients with AF and stenting. Pending completion of these trials, the patients with AF currently undergoing PCI/stenting would need strategies to reduce the duration of triple therapy and thus minimizing the risk of bleeding, for example, the preferential use of conventional bare-metal stents rather than drug-eluting stents in most of the lesions treated (indeed, drug-eluting stents should be limited to lesions or patients with a high risk of restenosis).\textsuperscript{9,10,15} This aspect is reaffirmed in our population in which the predictors of major

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
 & Whole Cohort (N=590) & HAS-BLED=0–2 (N=170; 28.8\%) & HAS-BLED $\geq 3$ (N=420; 71.2\%) & $P$ Value \\
\hline
Major bleeding & 7.8\% & 5.7\% & 8.6\% & 0.35 \\
Minor bleeding & 12.4\% & 8.5\% & 14.0\% & 0.29 \\
Emboli & 2.6\% & 3.4\% & 2.3\% & 0.55 \\
Death & 12.2\% & 7.3\% & 14.1\% & 0.04 \\
Acute myocardial infarction & 5.5\% & 3.4\% & 6.3\% & 0.21 \\
Target vessel failure & 14.5\% & 14.1\% & 14.7\% & 1.0 \\
Subacute or late thrombosis & 1.8\% & 1.5\% & 2.0\% & 1.0 \\
MACE & 16.1\% & 8.8\% & 18.9\% & <0.01 \\
MAE & 20.6\% & 12.8\% & 23.7\% & <0.01 \\
\hline
\end{tabular}
\caption{Events During Follow-Up}
\end{table}

$P$ value represents the comparison of events between HAS-BLED=0–2 and HAS-BLED $\geq 3$ groups. The comparisons were performed by Cox univariate analysis. HAS-BLED indicates Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile international normalized ratio, Elderly (>65 years), Drugs/alcohol concomitantly; MACE, major adverse cardiovascular event; MAE, major adverse event.

Figure 1. Major events in relation to the CHA\textsubscript{2}DS\textsubscript{2}-VASc and HAS-BLED scores. A, In the horizontal axis, CHA\textsubscript{2}DS\textsubscript{2}-VASc score and in the vertical axis, percent of major events: death in black, MACE (major adverse cardiovascular events) in gray and major bleeding in dotted bar. B, In the horizontal axis, HAS-BLED score and in the vertical axis, percent of major events: death in black, MACE (major adverse cardiovascular events) in gray, and major bleeding in dotted bar. CHA\textsubscript{2}DS\textsubscript{2}-VASc indicates congestive heart failure, hypertension, age $\geq 75$ years, diabetes, history of previous stroke, vascular disease, age 65–74 years, and sex category (female); HAS-BLED, Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile international normalized ratio, Elderly (>65 years), Drugs/alcohol concomitantly.
bleeding were the use of drug-eluting stents and chronic renal failure, the latter being a particularly high-risk group of patients. In general, a radial approach should also be considered as the elective option to reduce bleeding in relation with the PCI as well as a strategy of uninterrupted anticoagulation during PCI. Finally, patients treated with aspirin and OAC should receive concomitant proton pump inhibitors as well as strategies to maintain the international normalized ratio between 2.0 and 2.5 during the period of combination antiplatelet therapy to minimize bleeding risks.

### Limitations

A significant proportion of patients were not on OAC at the time of PCI but these data probably reflect “real-world” clinical practice with these complex patients. Residual confounding may be evident given that use of antithrombotic therapy regime was at the discretion of the responsible physician and nonrandomized. The associations shown in this study may not be causal because these are not randomized comparisons of OAC versus non-OAC use. Our use of “death of any cause” as a primary end point may also be
a limitation, but OAC does significantly reduce all-cause mortality in patients with AF by 26% compared with control.22 When considering the balance of risk and benefit, not every major complication (major bleeding, embolism, cardiac events) can be weighted equally23 and depending on the patient’s values and preferences, some may wish to avoid thrombotic complications (or even death) compared with reducing major bleeding complications or vice versa.

In conclusion, most patients with AF undergoing coronary stenting have a high risk for major bleeding (HAS-BLED score ≥3). Even in these patients, OAC seems to improve prognosis (reduced mortality and MACE), but with an increase in major bleeding; thus, management decisions in these high-risk patients should be individualized (eg, using both CHA2DS2-VASc and HAS-BLED scores as per guidelines) with the need for careful clinical review and regular follow-up. A randomized trial is warranted to study this complex population.

**Disclosures**

Dr Ruiz-Nodar has received research grants and speaker’s fees from Medtronic and Boston Scientific. Dr Marín has received research grants from Abbott and Boston Scientific; minor lecture honoraria from Lilly and Boehringer Ingelheim. Dr Hurtado has received research grants from Medtronic, Cordis, and Boston Scientific. Dr Valdés has received research grants from Medtronic, Cordis, Abbott and Boston Scientific; minor lecture honoraria from Lilly. Dr Roldán has received minor lecture honoraria from Boehringer Ingelheim.

**Table 3. Analysis of Predictors of Events in Patients With HAS-BLED ≥3**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Beta</th>
<th>SE</th>
<th>P Value</th>
<th>HR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coumarin at discharge</td>
<td>-1.60</td>
<td>0.59</td>
<td>&lt;0.01</td>
<td>0.20</td>
<td>0.06–0.64</td>
</tr>
<tr>
<td>Age</td>
<td>0.12</td>
<td>0.61</td>
<td>0.06</td>
<td>1.12</td>
<td>1.01–1.27</td>
</tr>
<tr>
<td>Type of AF (paroxysmal)</td>
<td>1.09</td>
<td>0.93</td>
<td>0.24</td>
<td>3.00</td>
<td>0.48–18.59</td>
</tr>
<tr>
<td>Hypertension</td>
<td>-0.31</td>
<td>1.14</td>
<td>0.79</td>
<td>0.74</td>
<td>0.08–6.95</td>
</tr>
<tr>
<td>Diabetes</td>
<td>-0.47</td>
<td>0.55</td>
<td>0.39</td>
<td>0.63</td>
<td>0.21–1.85</td>
</tr>
<tr>
<td>Renal failure (CrCl &lt;50 mL/min)</td>
<td>1.06</td>
<td>0.62</td>
<td>0.09</td>
<td>2.88</td>
<td>0.85–9.77</td>
</tr>
<tr>
<td>Heart failure</td>
<td>1.41</td>
<td>0.67</td>
<td>0.03</td>
<td>4.11</td>
<td>1.11–15.21</td>
</tr>
<tr>
<td>History of coronary disease</td>
<td>0.75</td>
<td>0.61</td>
<td>0.22</td>
<td>2.11</td>
<td>0.64–6.91</td>
</tr>
<tr>
<td>Use of DES</td>
<td>0.27</td>
<td>0.64</td>
<td>0.68</td>
<td>1.30</td>
<td>0.37–4.57</td>
</tr>
<tr>
<td>Aspirin at discharge</td>
<td>13.47</td>
<td>46.19</td>
<td>0.99</td>
<td>0.72</td>
<td>0.05–7.21</td>
</tr>
<tr>
<td>Clopidogrel at discharge</td>
<td>-2.56</td>
<td>1.45</td>
<td>0.08</td>
<td>0.08</td>
<td>0.04–1.33</td>
</tr>
</tbody>
</table>

**Cox regression for the analysis of MACE**

| Coumarin at discharge | -1.54 | 0.50 | <0.01 | 0.21 | 0.08–0.57   |
| Age       | 0.16 | 0.06 | <0.01 | 1.18 | 1.06–1.31   |
| Type of AF (paroxysmal) | 1.39 | 0.87 | 0.11 | 4.05 | 0.74–22.17  |
| Hypertension | 0.07 | 1.09 | 0.94 | 1.08 | 0.13–9.09   |
| Diabetes  | -0.81 | 0.49 | 0.10 | 0.44 | 0.17–1.15   |
| Renal failure (CrCl <50 mL/min) | 0.57 | 0.57 | 0.31 | 1.77 | 0.58–5.42   |
| Heart failure | 1.12 | 0.53 | 0.03 | 3.07 | 1.09–8.62   |
| History of coronary disease | 0.61 | 0.49 | 0.21 | 1.84 | 0.70–4.84   |
| Use of DES | 0.21 | 0.51 | 0.69 | 1.23 | 0.45–3.35   |
| Aspirin at discharge | 13.69 | 53.29 | 0.98 | 0.68 | 0.04–7.95   |
| Clopidogrel at discharge | -1.62 | 1.31 | 0.21 | 0.19 | 0.01–2.55   |

**Cox regression for the end point of major bleeding**

| Coumarin at discharge | 0.84 | 0.73 | 0.25 | 2.31 | 0.55–9.71   |
| Type of AF (paroxysmal) | 0.34 | 0.68 | 0.61 | 1.41 | 0.37–5.33   |
| Hypertension | 0.06 | 1.05 | 0.96 | 1.06 | 0.13–8.31   |
| Renal failure (CrCl <50 mL/min) | 1.35 | 0.49 | <0.01 | 3.88 | 1.48–10.16  |
| Heart failure | 0.54 | 0.49 | 0.27 | 1.72 | 0.66–4.51   |
| Use of DES | 2.07 | 1.04 | 0.04 | 7.93 | 1.04–60.51  |
| Aspirin at discharge | 13.37 | 73.28 | 0.98 | 1.69 | 0.24–7.35   |
| Clopidogrel at discharge | 13.48 | 23.69 | 0.99 | 1.89 | 0.28–9.35   |

HAS-BLED indicates Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile international normalized ratio, Elderly (>65 years), Drugs/alcohol concomitantly; HR, hazard ratio; AF, atrial fibrillation; CrCl, creatinine clearance; DES, drug-eluting stent; MACE, major adverse cardiovascular event.
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Should We Recommend Oral Anticoagulation Therapy in Patients With Atrial Fibrillation Undergoing Coronary Artery Stenting With a High HAS-BLED Bleeding Risk Score?

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cardiaques non fataux intervenus pendant des phases d’entraînement fractionné de haute intensité (46 364 heures d’exercice physique). Les informations collectées n’ont objective aucun infarctus du myocarde. Etant donné que le total des heures d’entraînement physique de haute intensité ne représentait que 36 % de celui des heures d’exercices d’intensité modérée, les taux de complications rapportés au nombre d’heures d’entraînement effectuées par les patients ont été de 1 pour 129 456 heures d’activité d’intensité modérée et de 1 pour 23 182 heures d’exercices énergiques.

**Conclusions**—Les résultats de cette étude montrent que le risque d’événement cardiovasculaire lié à l’application d’un programme de réhabilitation cardiaque est faible, que les exercices soient effectués à un rythme modéré ou élevé. Compte tenu des importants bénéfices cardiovasculaires associés à la pratique d’un entraînement physique énergique, ce type d’activité semble devoir être conseillé aux patients coronariens.


**Mots clés** : maladie coronaire ■ mort ■ subite ■ activité physique ■ arrêt cardiaque

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**Faut-il instaurer un traitement anticoagulant oral lors de la réalisation d’une coronaroplastie avec pose de stent chez un patient en fibrillation atriale dont le score de risque hémorragique HAS-BLED est élevé ?**

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**Contexte**—Les récentes recommandations européennes en matière de prise en charge de la fibrillation atriale préconisent d’instituer une anticoagulation orale (ACO) chez les patients dont le score CHA2DS2-VAsc (insuffisance cardiaque congestive, hypertension artérielle, âge atteignant 75 ans ou plus, diabète, antécédents d’accident vasculaire cérébral, pathologie vasculaire, âge compris entre 65 et 74 ans, sexe féminin) est égal ou supérieur à 1. Certains ont, par ailleurs, proposé d’utiliser le score HAS-BLED (hypertension artérielle, dysfonction rénale/hépatique, accident vasculaire cérébral, antécédent ou terrain hémorragique, labilité du rapport international normalisé, âge supérieur à 65 ans, prise concomitante de médicaments et d’alcool) pour évaluer le risque hémorragique chez les patients présentant une fibrillation atriale (un score égal ou supérieur à 1 évoquant un risque hémorragique élevé). En dépit des recommandations, cette approche n’a jamais été examinée dans une cohorte de patients en fibrillation atriale relevant d’une angioplastie coronaire percutanée avec pose de stent.

**Méthodes et résultats**—Notre étude a porté sur 590 patients consécutifs atteints de fibrillation atriale qui devaient faire l’objet d’une coronaroplastie percutanée avec pose de stent et dont le score CHA2DS2-VAsc était supérieur à 1 (ce qui, conformément aux recommandations, justifiait l’instauration d’une ACO). Nous avons comparé les patients qui encourageaient un risque hémorragique faible à intermédiaire (HAS-BLED compris entre 0 et 2) à ceux exposés à un risque élevé (HAS-BLED ≥3), étudié la relation entre les scores CHA2DS2-VAsc et HAS-BLED et confronté les bénéfices et les risques de l’ACO chez les patients présentant un risque hémorragique élevé. Nous avons recensé les épisodes hémorragiques, les événements thromboemboliques, les décès, les événements cardiaques, l’élément composite formé par les événements cardiaques majeurs (décès, infarctus aigu du myocarde et/ou revascularisation d’une lesion cible) et l’élément composite regroupant les événements majeurs (événement cardiaque majeur, hémorragie grave ou événement thromboembolique) survenus au cours d’une période de suivi d’un an. Dans la cohorte de l’étude, 420 (71 %) présentaient un score HAS-BLED égal ou supérieur à 3 ; chez les patients qui étaient sous ACO à leur sortie d’hôpital, la mortalité s’est révélée plus faible (9,3 % versus 20,1 % ; p <0,01), de même que le taux d’événements cardiaques majeurs (13,0 % versus 26,4 % ; p <0,01), alors que le taux d’événements majeurs a été similaire à celui observé dans l’autre groupe (20,5 % versus 27,6 % ; p = 0,11) ; en revanche, l’incidence des hémorragies graves a été plus élevée (11,8 % versus 4,0 % ; p <0,01). L’analyse de Cox multivariée effectuée chez les patients dont le HAS-BLED était égal ou supérieur à 3 a montré que les facteurs prédictifs d’un risque de décès majeur avaient été l’insuffisance rénale chronique et l’insuffisance cardiaque (p <0,05 dans les deux cas), alors que le fait d’avoir été sous ACO à la sortie de l’hôpital avait contribué à diminuer le risque de décès (p <0,01). Les facteurs prédictifs de la survenue d’une hémorragie grave ont été l’insuffisance rénale chronique et la pose de stents à libération de principe actif (p <0,05 dans les deux cas).

**Conclusions**—La plupart des patients en fibrillation atriale faisant l’objet d’une angioplastie coronaire percutanée avec pose de stent présentent un risque élevé d’hémorragie grave (score HAS-BLED ≥3). Même chez ces patients, l’instauration d’une ACO améliore le pronostic (diminution des risques de décès et d’événements cardiaques majeurs), au prix, toutefois, d’une augmentation du risque d’hémorragie grave. *(Traduit de l’anglais : Should We Recommend Oral Anticoagulation Therapy in Patients With Atrial Fibrillation Undergoing Coronary Artery Stenting With a High HAS-BLED Bleeding Risk Score? *Circ Cardiovasc Interv*. 2012;5:459–466.)*

**Mots clés** : fibrillation atriale ■ risque hémorragique ■ anticoagulation orale ■ pose de stent