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Risk scores and geriatric profile: can they really help us in anticoagulation decision making among older patients suffering from atrial fibrillation?

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Conflict of interest

None. The authors have no conflicts of interest that are directly relevant to the content of this article.

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ABSTRACT

Objectives. Anticoagulation for the prevention of cardio-embolism is most frequently indicated but largely underused in frail older patients with atrial fibrillation (AF). This study aimed at identifying characteristics associated with anticoagulation underuse.

Methods. Cross-sectional study of consecutive geriatric patients aged ≥ 75 years, with AF and clear anticoagulation indication ($CHADS_2$ ≥ 2) upon hospital admission. All patients benefited from a comprehensive geriatric assessment. Their risks of stroke and bleeding were predicted using $CHADS_2$ and $HEMORR_2HAGES$ scores, respectively.

Results. Anticoagulation underuse was observed in 384 (50%) of 773 geriatric patients with AF (median age 85 years; female 57%, cognitive disorder 33%, nursing home 20%). No geriatric characteristic was found to be associated with anticoagulation underuse. Conversely, anticoagulation underuse was markedly increased in the patients treated with aspirin (Odds Ratio [95% CI]: 5.3 [3.8; 7.5]). Other independent predictors of anticoagulation underuse were ethanol abuse (OR: 4.0 [1.4; 13.3] and age ≥ 90 years (OR: 2.0 [1.2; 3.4]). Anticoagulation underuse was not inferior in patients with a lower bleeding risk and/or a higher stroke risk and interestingly it was not inferior either in the AF patients with a previous stroke.

Conclusion. Half of our geriatric population did not receive any anticoagulation despite a clear indication, regardless their individual bleeding or stroke risks. Aspirin use is the main characteristic associated with anticoagulation underuse.

INTRODUCTION

The underuse of indicated medications in elderly patients is currently and increasingly under scrutiny and known to cause adverse outcomes.[1] The particular issue of anticoagulation underuse in patients with atrial fibrillation (AF) is well documented, including in elderly patients.[2-8]

AF is the most frequent cardiac arrhythmia in the elderly and its prevalence increases with age.[9] Moreover, two-thirds of AF cases concerns patients aged 75 years or more,[10] in whom AF prevalence exceeds 10%. Consequently, AF management is everyday practice for physicians in charge of elderly patients. Guidelines on pharmacological management of AF recommend the use of antithrombotic agents,[11, 12] as this arrhythmia largely increases the risk for cardio-embolism and specifically stroke.[13] Oral anticoagulant therapy, such as vitamin K antagonists (VKAs), is recommended in patients at high risk of stroke (≥ 4% par year), while antiplatelet agents offer a possible alternative in patients at low stroke risk, _ENREF_11an infrequent situation in frail older patients.[11]

The translation of these guidelines into clinical practice remains a challenge.[14, 15] Even if there is strong evidence that antithrombotic treatment is beneficial in elderly patients and might effectively prevent numerous ischemic strokes,[16-18] data shows that approximately half of the older patients in AF do not receive the recommended cardio-embolic prophylaxis.[19, 20] As the Western population gets incessantly older and AF is highly prevalent in elderly patients, it is worth getting better understanding of older patients' characteristics associated with anticoagulation underuse. Frailty, which increases the risk of stroke but not of major haemorrhages has been reported to be associated with lower VKA use in a few studies.[21, 22] _ENREF_22 _ENREF_20Patient-related reasons cited to refrain the prescription of anticoagulant therapy in the elderly include straight contra-indications, advanced age, comorbidities, history or increased risk of bleeding, falls and low compliance.[4, 14, 23-26] Some of these reasons are supported by evidence while others are not. Withholding of anticoagulant therapy seems appropriate and legitimate in the presence of true contra-indications (eg previous major bleed, thrombopenia, low compliance). In other cases (eg risk of falls, advanced age), the risk-benefit ratio of anticoagulation is favorable.[27] There is obviously a need for revisiting the prescription of anticoagulant therapy in the light of the individual assessment of the overall risks and benefits. The perception of the opposite risks of stroke and bleeding varies among physicians[25, 28] and remains highly challenging.

Tools are currently available to help physicians assess these two risks (clotting or bleeding) in the older patients with AF, i.e. the $CHADS_2$ score to predict the annual stroke risk[29] and the $HEMORR_2HAGES$ score[30] to predict the risk of major bleeding. The

aim of this study was to identify characteristics related to the underuse of anticoagulant therapy in geriatric patients in the light of their bleeding and cardio-embolism risk profile.

MATERIAL & METHODS

Study design and patient population

We conducted a cross-sectional study including consecutive older patients with AF admitted between January 2008 and December 2010 in the Cliniques universitaires Saint-Luc, Brussels, Belgium. Inclusion criteria were 1) older age (≥ 75 years); 2) evidence of current or recent AF; 3) indication for anticoagulation defined by a $CHADS_2$[29] score ≥ 2; and 4) comprehensive geriatric assessment (multi-disciplinary assessment including medical aspects but also psycho-social and relational evaluation, nutritional assessment and physio/ergotherapy testing) by the acute geriatric unit or the inpatient geriatric consultation team (providing geriatric counseling in non-geriatric wards for older patients with frailty defined by a ISAR score ≥ 2).[31] We excluded the few patients with another indication for anticoagulants (eg metallic valve, history of deep venous thrombosis/pulmonary embolism in the last 6 months) or with anticoagulants contra-indication (surgery in the last 3 weeks, peptic ulcer in the last 3 months).

Data collection

Socio-demographic data included age, gender and residency (private home vs. nursing home). Geriatric profile was assessed through functional dependency for basic activities of daily living using the Katz scale,[32] frailty profile (ISAR) and the presence of cognitive disorder (clinical diagnosis or Mini Mental State Examination < 24/30),[33] malnutrition (assessed on the basis of a nutritionist evaluation and/or a body mass index of <21 kg/m2 and/or a mid-arm circumference <23 cm and/or albumin < 3g/dl), history of recent fall (within the 6 previous weeks), and excessive risk of falls (history of falls, dementia, Parkinson's disease, or evidence according to the team's physiotherapist). The use of antiplatelet therapy and/or anticoagulation therapy **(**VKAs or low molecular weight heparin at a dosage offering effective anticoagulation) at home the day before admission was recorded. The new oral anticoagulants (NOACs, ie apixaban, dabigatran, rivaroxaban) were not marketed in Belgium for cardio-embolic prevention in AF before the end of this study. Medical data specifically included the presence or absence of all the items of the $CHADS_2$ and the $HEMORR_2HAGES$ scores.

Scores of cardio-embolism and bleeding risks

The AF-related risks of stroke and of bleeding were assessed using, respectively, the $CHADS_2$ score[29] and the $HEMORR_2HAGES$ score.[30] We chose to use the $CHADS_2$ score for several reasons. In contrast to the CHA_2DS_2-VASc score[34] (recently developed to identify AF patients at very low risk of cardio-embolism who do not require anticoagulation, ie a very infrequent situation in frail older patients), the $CHADS_2$ score 1) was developed in a population of older patients; 2) correlates with the stroke risk in

a linear, precise (narrow confidence intervals) and valid (C statistics) manner; 3) correlates with the prescription habits in geriatric patients;[35] 4) is easy to remember and to use in the daily practice; and 5) was available at the time of anticoagulation decision in this study. Moreover, according to the CHA_2DS_2-VASc score, all the patients aged over 75 years should be on anticoagulation, which is controversial in older patients with lower annual stroke risk (<4%) and significant bleeding risk. The $CHADS_2$ score (range 2-6/6 in this study) gives 1 point for the presence of each cardio-embolism risk factor, namely Congestive heart failure (within last year), Hypertension (antihypertensive regimen or ≥ 160/90 mmHg on several occasions), Age ≥75 years, Diabetes mellitus or anti-diabetic drugs or fasting blood glucose ≥ 126 mg/dl on several occasions), and 2 points for Stroke or transient ischemic attack (TIA) history.

_ENREF_33

_ENREF_36 _ENREF_37The $HEMORR_2HAGES$ score seemed to us more appropriate than the more recent HAS-BLED score[36] for the following reasons: 1) it was developed in a population of older patients; 2) its includes items relevant to a geriatric population (eg: age > 75 years, malignancy, anaemia, reduced platelet function due to antiplatelets therapy, and excessive fall risk), 3) it precisely predicts (narrow confidence intervals) the risk of major bleeding events when treated by anticoagulation; 4) it correlates with the actual prescription of anticoagulants in geriatric patients.[35] These features are not present in the HAS-BLED score. Furthermore, the HAS-BLED item “labile INRs” item is not available at the time of decision-making on starting anticoagulation.[36] $HEMORR_2HAGES$ is the most suitable score to assess bleeding risk in older patients according to a recent French expert consensus on the management of AF in older

people.[10]

The HEMORR$_2$HAGES score (range 1-12/12 in this study) is computed by adding 1 point for each of the following bleeding risk factor: Hepatic (cirrhosis with Child-Pugh score ≥ 3) or renal failure (estimated Glomerular Filtration Rate eGFR[37] < 30 ml/min), Ethanol abuse, Malignancy, Older age, Reduced platelet count (<150.000/µl) or function (use of platelet aggregation inhibitors), uncontrolled Hypertension, Anaemia (haemoglobin < 10 g/dl), Genetic factors, Excessive fall risk, Stroke, and by adding 2 points for Rebleed risk, ie history of a major bleeding event (haemoglobin decline of ≥ 2 g/dl, blood transfusion of ≥ 2 units, or bleeding in a major organ) and recent (last three years).[38]

Objectives

The aim of our study was first to assess the underuse of anticoagulation (VKA or low molecular weight heparin at full therapeutic dosage) before hospital admission, in older patients with clear clinical indication of anticoagulation according to the CHADS$_2$ score. Secondly, we wanted to better characterize these non-anticoagulated patients regarding their cardiovascular and geriatric profile and their CHADS$_2$ and HEMORR$_2$HAGES scores in order to search for modifiable characteristics associated with anticoagulation underuse

Statistical Analysis

All continuous variables not normally distributed were summarized using the median and the inter-quartile range [P_{25}-P_{75}] and were compared between groups using Wilcoxon rank sum test or Kruskal-Wallis test, depending on the number of groups in the comparison. Categorical variables were expressed using percentages and were

compared using Chi-squared test or the Fischer's exact test, as appropriate. Multivariate logistic regression was used to assess the independent predictors of anticoagulation underuse among the total cohort as well as in this subgoup ofpatients with a history of stroke. In order to avoid co-linearity, the correlation coefficients between covariates were calculated. In case of co-linearity (*r*-value >0.90), only one of the two covariates was considered in the multivariate model. Variables with a P-value ≤ 0.20 in univariate analysis were submitted to the multivariate model. A stepwise procedure using Akaike's information criterion was used to select independent multivariate predictors of anticoagulation underuse. Model goodness of fit was examined using Hosmer-Lemeshow test (null hypothesis: the model is a good fit for the data). All statistical analyses were performed using R version 2.15.1 and a p-value < 0.05 was considered as statistically significant.

RESULTS

Patient's characteristics

773 frail older patients (median age 85.0 years; female gender 57%) met the inclusion criteria. Geriatric syndromes were frequent (eg malnutrition 47%, recent fall 42%, cognitive disorder 33%). Half of the patients were dependent (median Katz score: 9) and one fifth were nursing home residents.

The annual risk of stroke was high (mean ± SD: 6.9 ± 3.3%; median 5.9%) as predicted by the $CHADS_2$ score and its items (congestive heart failure 49%, hypertension 83%,

age ≥ 75 years 100%, diabetes 21%, and stroke/TIA 32%). The annual risk of bleeding was high also (mean ± SD: 9.7 ± 2.2%; median 10.4%), based on the HEMORR$_2$HAGES score and its prevalent items (eg risk of fall 63%, reduced platelet function/count 56%, in addition to older age, hypertension and stroke history).

Underuse of anticoagulation

Of these 733 patients with indication for anticoagulant therapy, half (50.3%, n=389) were on VKA (n=330) or low molecular weight heparin (n=59), while the other half was not anticoagulated (49.7%, n=384) at home before the hospital admission. Among the 330 patients on VKA treatment, the admission international normalized ratio (INR) was infra-therapeutic (INR < 2) in 56%, on target (2 < INR < 3) in 21% and supra-therapeutic (INR > 3) in 22% (admission INR unknown in 4 patients =1%). Table 1 compares patients on anticoagulation to those with no anticoagulation in terms of socio-demographic data, geriatric syndromes as well as risk factors and predicted annual rates of stroke and bleeding.

Patients with no anticoagulation significantly (p<0.01) had higher use of antiplatelet therapy (61 vs. 27%, p<0.001), older age (86 vs. 85 years, p=0.004), and higher annual bleeding risk according to HEMORR$_2$HAGES (p<0.001). However, the latter was not different when corrected for antiplatelet agents use (ie withdrawing one point to all the patients on antiplatelets therapy; 8.4 [8.4;10.4] vs. 8.4 [8.4;10.4], p=0.41).

Univariate analysis confirmed that anticoagulation underuse was neither associated with geriatric syndromes (malnutrition, falls, cognitive disorder, functional

dependency) nor with the $CHADS_2$ score. Potential risk factors (p-value ≤ 0.2) of anticoagulation underuse were antiplatelet therapy, ethanol abuse, age older than 90 years, fall risk, and nursing home residency (Table 2, left column). The $HEMORR_2HAGES$ score, which includes three of the above-mentioned risk factors (ethanol abuse, antiplatelet therapy and fall risk), was associated with anticoagulation underuse in the univariate analysis. However, the multivariate analysis (Table 2, right column) identified three variables as independent predictors of anticoagulation underuse, namely antiplatelet therapy (OR 5.3), ethanol abuse (OR 4.0) - a feature present in only 2.5% of the patients - and age older than 90 years (OR 2.0).

Anticoagulation underuse and antiplatelet therapy

As antiplatelet therapy was the strongest determinant of anticoagulation underuse, we raised the hypothesis that patients on antiplatelet agents but no anticoagulation (n=233) had been at higher bleeding risk ($HEMORR_2HAGES$ score) and/or lower stroke risk ($CHADS_2$ score) than those on anticoagulation (n=389). Table 3 shows that this was not the case. These two groups did not show difference in the $CHADS_2$ score nor in the $HEMORR_2HAGES$ score corrected for antiplatelet agents use (ie withdrawing one point to all the patients on antiplatelets therapy). In stable vascular disease, antiplatelets can indeed be stopped in patients under anticoagulants.[39, 40] [10, 11]

Anticoagulation underuse after stroke

We further studied the 229 patients with AF and a history of stroke, in whom anticoagulation underuse was expected to be lower. Surprisingly, anticoagulation underuse was present in 109 (48%) of these patients with a previous stroke, and not

lower than in those free of stroke (51%) (p = 0.45). The geriatric profile of these 229 frail older stroke patients (median age 85 years, female 52%, nursing home 27%) was similar to this of the overall study group. In multivariate analysis, the single independent factor associated with anticoagulation underuse in these stroke patients was antiplatelet agent use (OR [95%CI]: 5.0 [2.9;8.8] (p<0.001). Neither $CHADS_2$ nor $HEMORR_2HAGES$ score was determinant of anticoagulation underuse in patients with AF and stroke.

DISCUSSION

The main finding of this study in frail older patients with AF was that the strongest predictor of anticoagulation underuse was the use of antiplatelet therapy, a reversible characteristic allowing improvement in prescribing and stroke prevention. Aspirin (acetylsalicylic acid) is known to be of limited efficacy in stroke prevention,[41] especially as age increases.[42] Warfarin is more effective that aspirin, also in older patients.[43] Moreover, warfarin is safer than aspirin in octogenarians, as shown in the WASPO trial, which found significantly more adverse events with aspirin (33%) than with warfarin (6%), including serious bleeding.[44] Surprisingly, the large anticoagulation underuse (69%) in our patients on antiplatelet therapy was not explained by a lower risk of cardio-embolism or a higher risk of bleeding. We found thus not clinical rationale underlying the withholding of anticoagulation. We suspect that aspirin was prescribed in some patients for AF-related stroke prevention, while in the others - the majority probably - for underlying cardiovascular ischemic disease. It has been proposed not to

add aspirin for associated stable vascular disease[45] in patients with AF receiving anticoagulation, as there is no evidence that adding aspirin to warfarin reduces stroke or other vascular events in these patients.[39, 46] In such patients, in line with recent guidelines, we suggest that aspirin be withdrawn and anticoagulation prescribed in monotherapy if the coronary ischemic event occurred more than one year ago.[18, 47]

The observation that stroke history was not related to higher use of anticoagulation is another important finding of our study. Nearly half (48%) of these high risk patients in secondary stroke prevention presented with anticoagulation underuse, despite no significant difference in their geriatric profile, stroke risk or bleeding risk. A similar observation was reported in elderly patients with AF and recent ischemic stroke, in whom warfarin use decreased with age,[6] a finding not observed in our study. However, we have not considered possible hemorrhagic conversion of stroke as potential cause of not prescribing anticoagulant therapy.

Medical-decision making in terms of anticoagulation in older patients is complex. The more advanced the age, the higher the risks of both clotting and bleeding. Warfarin and other VKA are feared by clinicians in the elderly because of complex kinetics, multiple interactions and narrow safety windows. We used the $CHADS_2$ and the $HEMORR_2HAGES$ ENREF_10 scores which offer several advantages in the elderly population. Neither the $CHADS_2$ score nor the corrected $HEMORR_2HAGES$ score was found to be independent determinant of VKA underuse in our hospital admitted patients. Our observations differ from those reported in long-term care residents

where warfarin use increased with higher stroke risk and with lower bleeding risk.[48] Our results confirm the observation of Marcucci and colleagues, that cardio-embolic and bleeding risks are not the main determinant of the therapeutic choice in elderly patients with AF.[19]

We believe that risk prediction tools, eg the $CHADS_2$ and the $HEMORR_2HAGES$ scores, should be more generally used in primary care practice to help physicians balance the risk-benefit ratio for anticoagulation in individual frail older patients, who are often at high risks of thrombo-embolism and bleeding. On one hand the $CHADS_2$ score predicts cardio-embolism events, which imply significant morbi-mortality, and on the other hand the $HEMORR_2HAGES$ score predicts "major bleedings" without any distinction between muscular or digestive bleedings, which are manageable, and intracranial or life-threatening bleedings. Maybe should we consider to weight this "global bleeding" risk score in order to allow a reasonable comparison between both risk scores and so to determine the net clinical benefit for the patient more accurately, especially at the cerebral level. This is a crucial point knowing that Friberg et al[49] already demonstrated that the cerebral risk of ischemic stroke without anticoagulant treatment exceeds the cerebral risk of intracranial bleeding with anticoagulant treatment at almost every combination of stroke and bleeding risks.

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Our study confirms the general tendency among physicians to underuse anticoagulants in the elderly with AF. _ENREF_50This large underuse rate (~50%) is concordant with previous literature data.[19, 20, 25, 50-54] _ENREF_13 Besides antiplatelet therapy, discussed

above, two other characteristics were found to be independent predictor of anticoagulation underuse in our multivariate analysis: ethanol abuse and patient's very old age (≥ 90 years). The former was infrequent and strong, while the latter was frequent and weak. Although age is an independent risk factor for bleeding with all anticoagulation modalities,[42, 55] age should not be regarded as a contraindication to anticoagulation treatment. In a large study on very old patients (median age 84 years) on VKA carefully monitored by anticoagulation clinics, the rate of major bleeding was low (1.9%/year).[56] Moreover, the risk for stroke increases with older age in patients with AF.[9, 57] Therefore, the withholding of anticoagulation on the sole reason of older age can be considered as ageism.[1] We did not find any association between anticoagulation underuse and geriatric syndromes, as reported by De Breuker et al (dementia, malnutrition, functional dependency, risk of fall),[20] or Sanchez-Barba et al (depression, cognitive disorders),[22] neither with gender, haemorrhage history or malignancy.[19, 58]

Our study presents several strengths. Firstly, it focuses on a highly relevant and complex topic in the daily medical practice, as the elderly population grows constantly and anticoagulation drugs are frequent long-term medications in elderly patients. Secondly, it is quite original, as few previous studies analyzed in a large and representative frail older population with AF both medical and geriatric characteristics as potential predictors of anticoagulation underuse. Thirdly, there is currently few data in literature comparing both risk scores in a face-to-face way, especially among geriatric patients.[59]

The study shows some limitations. It was retrospective and based on assessments conducted during a hospital stay. Nevertheless, we had access to a large and valuable amount of information brought by the comprehensive geriatric assessment. We could not explore all the potential factors affecting the anticoagulation decision, particularly the general practitioner-related reasons or the patient's preferences. It has already been demonstrated that anticoagulation under-prescribing is partially explained by the fact that general practitioner's would feel personally responsible for a iatrogenic hemorrhagic complication, as opposed to a cardio-embolic complication in absence of treatment.[60] Finally, it was not possible to evaluate patient's compliance in our cross-sectional study, which is a crucial point with that type of medication in geriatric patients. Complementary further qualitative work would help understand reasons underlying anticoagulant underuse.

_ENREF_61 This study was conducted before the marketing of NOACs in our country (2012), nowadays used in AF. We believe that these NOACs will be of little help in decreasing the anticoagulation underuse during the coming years in the frail older population. Due to short half-life, adherence to treatment remains a challenge with these drugs. The lack of reliable monitoring tests, of reversal agent and cost are other barriers to the prescribing of NOACs, which were not encountered with VKAs.[61] Three characteristics associated with anticoagulation underuse in our study, namely renal impairment, antiplatelet use, and ethanol abuse, will not disappear with the use of NOACs. We believe that the decision to prescribe anticoagulation is a global concept

and that the type of molecule (VKA vs. NOAC) is not influencing significantly the decision-making in this specific population. Future studies should compare the prevalence of underuse after the marketing of NOACS with the present results in order to test this hypothesis.

In summary, our study showed that underuse of anticoagulation concerns half of the frail older patients with AF and yet anticoagulation indication. Underuse of anticoagulation could not be clinically explained in this population, and was mainly related to use of aspirin. In this context, the use of risk scores may be useful to help the clinician in the decision making process. Nevertheless the net clinical benefit remains difficult to assess knowing that these scores predict events of varying severity and therefore remain difficult to compare for each individual case.

Table 1. Characteristics of older patients in atrial fibrillation on anticoagulation or not

	On anticoagulation n = 389	No anticoagulation n = 384	p-value
Socio-demographic			
Age, median [P_{25}-P_{75}]	85 [81-88]	86 [82-89]	0.004
Female gender, %	54.8	58.6	0.28
Living in nursing home, %	17.2	23.2	0.04
Geriatric features, %			
Malnutrition	45.0	48.6	0.32
Recent fall	42.7	42.2	0.89
Cognitive disorder	31.9	34.6	0.42
Dependency in ADL (Katz score ≥10/24)	45.9	49.3	0.33
$CHADS_2$, stroke risk			
Score, median [P_{25}-P_{75}]	3 [2-4]	3 [2-4]	0.17
Risk, %/year, median [P25-P75]	5.9 [4.0-8.5]	5.9 [4.0-8.5]	
Items, %			
Congestive heart failure	50.4	47.1	0.37
Hypertension	82.2	83.1	0.77
Age ≥ 75 years	100	100	
Diabetes mellitus	21.6	21.0	0.80

Stroke or TIA	34.0	30.7	0.34
HEMORR$_2$HAGES, bleeding risk			
Score, % median [P_{25}-P_{75}]	4 [3-4]	4 [3-5]	<0.001
Risk, %/year, median [P_{25}-P_{75}]	10.4 [8.4-10.4]	10.4 [8.4-12.3]	
Items, %			
Hepatic / renal failure	14.6	13.8	0.74
eGFR<30ml/min	13.4	11.5	0.42
Ethanol abuse	1.3	3.6	0.03
Malignancy	9.0	10.7	0.43
Reduced platelets	45.0	68.0	<0.001
Antiplatelet therapy	26.5	60.7	<0.001
Thrombopenia	18.3	7.0	<0.001
Rebleeding	6.9	4.9	0.24
Anaemia (Hb<10 g/dl)	16.5	16.9	0.86
Excessive fall risk	60.4	65.4	0.15
Stroke	30.8	28.4	0.45

Abbreviations: **ADL** = activites in daily living; **eGFR** = estimated Glomerular filtration rate (using the MDRD-4 formula), **Hb** = haemoglobin; **TIA** = transient ischemic attack

Table 2. Determinants of anticoagulation underuse in 773 frail older patients

	Univariate analysis			Multivariate analysis		
	OR	[95% CI]	P-value	OR	[95% CI]	P-value
Antiplatelets use	4.28	[3.17-5.83]	<0.001	5.27	[3.75-7.48]	<0.001
Ethanol abuse	2.91	[1.10-9.07]	0.043	4.00	[1.39-13.31]	0.014
Age						
≥ 90 years	1.67	[1.03-2.71]	0.039	2.00	[1.18-3.43]	0.011
≥ 85 and <90 years	1.07	[0.70-4.66]	0.745	1.11	[0.69-1.79]	0.673
≥ 80 and < 85 years	0.99	[0.64-1.54]	0.976	0.86	[0.53-1.40]	0.549
≥ 75 and < 80 years	1.00			1.00		
Excess fall risk	1.24	[0.92-1.66]	0.154	1.36	[0.95-1.93]	0.090
Living in nursing home	1.45	[1.02-2.08]	0.038	1.37	[0.93-2.03]	0.115
Hosmer-Lemeshow goodness-of-fit p-value = 0.76, indicating that the model is a good fit for the data.						

Table 3. Comparisons between patients on anticoagulant and patients on antiplatelet agents.

	Anticoagulant[a]	**Antiplatelet[b]**	
	(n=389)	**(n=233)**	**p-value**
Significant variables			
Antiplatelet therapy	26.5	100	< 0.001
Vascular disease	48.9	62.2	0.003
Ethanol abuse	1.3	3.9	0.036
Risk prediction			
$CHADS_2$ score			
Median score [P_{25}-P_{75}]	3 [2-4]	3 [2-4]	NS
Risk, %/year, median [P25-P75]	5.9 [4.0-8.5]	5.9 [4.0-8.5]	
$HEMORR_2HAGES$ score			

Median score [P25-P75]	4 [3-4]	4 [4-5]	< 0.001
Risk, %/year, median [P25-P75]	10.4 [8.4-10.4]	10.4 [10.4-12.3]	
Corrected HEMORR$_2$HAGES [c]			
Median score [P25-P75]	3 [3-4]	3 [3-4]	NS
Risk, %/year, median [P25-P75]	8.4 [8.4-10.4]	8.4 [8.4-10.4]	

Abbreviations: NS = non significant

a Anticoagulant: with or without antiplatelet therapy

b Antiplatelet: without anticoagulation

c Corrected HEMORR$_2$HAGES: no point given for antiplatelet therapy

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