Limitations of CHADS₂ Scoring System in Predicting Stroke Risk – Need to change the Age Criteria

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Introduction: Atrial fibrillation (AF) is the most common arrhythmia with a strong association with age. The aim of this study was to evaluate the rate of stroke in relation to age and anticoagulation status based on CHADS² risk criteria. Methods: This study included all patients with non-valvular atrial fibrillation admitted to our clinic between 1/11/2007 and 1/11/2009, with minimum one year follow up for patients without stroke. We calculated risk based on CHADS² (C-cardiac failure, H- hypertension, A-age >75 years, D-diabetes mellitus, S-stroke) point system and evaluated anticoagulation status at the moment of first occurrence of stroke. We observed the rate of stroke in different group age. Results: The average of participants with AF was 67.9±10.3 years. Amongst 302 patients with non-valvular atrial fibrillation, 32.5% had been anticoagulated while 13.9% of experienced stroke. The stroke were more present in patients who used aspirin in age group 65-74 (22.5%, P=0.014). The mean age of patients who experienced stroke were 67.2, SD±10.8 vs 71.6, SD±5.1, P=0.000. Of the patients with stroke from age group 65-74 years, 23 were in CHADS² 0-1 scoring system. Conclusion: The higher rate of stroke was in the 65-74 years age group, with CHADS² scoring system 0-1, and without anticoagulation therapy. Therefore modification has to be considered for the CHADS² scoring system to account the age as a risk factor for population in different regions. Key words: Atrial fibrillation, Age, Anticoagulation, Stroke.

1. INTRODUCTION

Atrial fibrillation (AF) is the most common cardiac arrhythmia affecting about 1% of the population, and its prevalence and incidence increase with age (1, 2).

Approximately 70% of people with AF are between 65 and 85 years of age (3, 4). Risk for ischemic stroke also increases gradually with age (5), therefore the adequate anticoagulation can reduce the risk of stroke and other vascular events considerably (6). Anticoagulation with warfarin reduces stroke by approximately 60% (7, 8), whereas comorbidities showed to play a important role in disease progression.

While CHADS² scoring system has age (A) >75 years as a risk factor, the objective of this study was to evaluate the incidence of stroke and anticoagulation status in different age groups of patients with non-valvular AF.

2. SUBJECTS AND METHODS

All patients with non-valvular AF admitted to our clinic between 1/11/2007 - 1/11/2009 were enrolled into the study. On enrolment we obtained data and information about age, hypertension, congestive heart failure, diabetes mellitus, or previous stroke. Inclusion criteria were the presence of AF on admission or prior ischemic stroke confirmed by 12-lead ECG. Any anticoagulant therapy being used was documented from medical records. We observed the use of anticoagulant therapy based on CHADS² (C-cardiac failure, H- hypertension, A-age >75 years, D-diabetes mellitus, S-stroke) scoring system and INR (International Normalized Ratio); between 2.5-3 was considered as a necessary criterion for the use of anticoagulants. Patients with valvular AF confirmed by 2D transthoracal echocardiography (Philips IE33) and those with contraindications to anticoagulant therapy were excluded from the study. All events occurring during the study period were observed in both hospital and ambulatory patients. Stroke was defined as the sudden onset of a focal neurological deficit with no apparent cause other than that of AF origin occurred during in-hospital period confirmed by neurologists or documented from medical records.

We calculated the total CHADS² score and observed anticoagulation status at the moment of stroke.
3. STATISTICAL ANALYSIS

Comparisons between patient groups were performed using the Chi-square test for categorical variables and the Student’s t-test for the continuous variables, with P value of 0.5 suggesting a statistically significant difference. All statistical analysis were performed using InStat 3 software.

4. RESULTS

During the study period, we identified 321 patients with atrial fibrillation, predominantly men.

From the study population we excluded 19 patients either with valvular atrial fibrillation, confirmed by 2D transthoracic echocardiography, or with contraindications to anticoagulant therapy. Characteristics of study population are shown in Table 1. The mean age of participants with AF was 67.9, SD±10.3 years. Of the 302 included patients, 98 (32.5%) used oral anticoagulants and 204 (67.5%) used aspirin. Of the 42 (13.9%), predominantly female patients (32 vs 10, P=0.031), who experienced stroke, 32 (15.7%, P=0.226) were in the aspirin group. The mean age of patients who experienced stroke were 67.2, SD±10.8 vs 71.6, SD±5.1, P=0.000 (Table 2). Of the 30 patients with stroke belonged to the age group 65-74 years 23 were in CHADS² 0-1 scoring system without anticoagulation therapy.

5. DISCUSSION

The present study conducted at a single center shows that atrial fibrillation as a heart rhythm disturbance was more present in elderly (>65 years), predominantly male patients. In patients with AF, stroke risk increases with age, whereas use of adequate anticoagulation therapy can reduce this risk. Studies showed that warfarin is substantially more efficacious than antiplatelet therapy (7, 9, 10, 11) whereas use of warfarin reduces not only the frequency of stroke but also its severity and risk of death from stroke (12). Stroke in AF is associated with poor prognosis and has higher in-hospital mortality than in non-AF (13, 14). CHADS² score reported to be a effective for anticoagulation therapy also a good predictor of stroke (15), however in our study we have found that many patients (67.5%) admitted to our clinic were not given oral anticoagulants for stroke prevention in AF, and these results are higher compared to those obtained in a SCAF study (54%) (16). Although stroke risk increases with age, limit for age to be considered as a risk factor based on CHADS² score classification is over 75 years old. Results from our study showed that 71.4% of AF patients with stroke, who were in the age group 65-74 years, had a CHADS² risk score 0-1 and were not anticoagulated. A recent study reported that only 10% of patients with stroke with known AF are therapeutically anticoagulated at admission (17) which is in line with our study for this group age, 13.3%. The effect of age as a risk factor in patients with RA is debatable. The results we found could suggest an embolism may be caused from hipercoaguable state in patients with presence of one of comorbidities (CHADS² score 0-1), which significantly can modulate progression and complications of AF (18).

Amongst our study population in-hospital mortality was (5.29%), in elderly and not coagulated patients. It is reasonable to think that in RA patients with presence of one comorbidity (CHADS² score 1) especially if long disease activity is present, age over than 65 years is a risk factor.

6. CONCLUSION

Considering that most patients who experienced stroke in our study were in the age group 65-74 years, CHADS² score risk system for age (A >75 years) was not a good predictor in this case. Therefore, modification of CHADS² scoring system to account the age as a risk factor for population of different
regions should be considered.

Limitations Study - limitations are: small group of patients and short period of study.

REFERENCES