Admission blood glucose level as an ischemic stroke risk modifier in patients with new-onset non-valvular atrial fibrillation

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Background: Several scores have been proposed to assess the stroke risk in patients with non-valvular atrial fibrillation (NVAF). However, type 2 diabetes mellitus (T2DM) is considered a major stroke risk factor regardless of glycemic control. Whether basal blood glucose level modifies the risk of stroke in NVAF is still unclear.

Purpose: To evaluate the risk of ischemic stroke according to the presence of T2DM and admission blood glucose (ABG) level in patients with new-onset NVAF starting direct oral anticoagulants (DOACs).

Methods: We analyzed all consecutive patients with NVAF at our outpatient clinic from January to December 2018. The study population was constituted by 1014 patients with new-onset NVAF starting DOACs. Baseline characteristics were evaluated in the overall cohort whereas outcomes were assessed for 915 patients. The median follow-up time was 19.6±12.9 months.

Results: Overall, 50.3% were male with a mean age of 73.9±12.5 years. Diabetic NVAF patients were more frequently male (p=0.04) with higher prevalence of dyslipidemia (p<0.001), hypertension (p<0.001), severe renal impairment (p=0.02), peripheral vasculopathy (p=0.007) and history of myocardial infarction (p<0.001) compared to non-diabetic NVAF. Conversely, no differences were observed between subgroups in terms of age (p=0.8). Baseline blood glucose level was significantly higher in the diabetic NVAF population (160±67 mg/dL vs 119±39 mg/dL; p<0.001). As expected, the mean CHA2DS2-VASc score was significantly higher in diabetic NVAF compared to non-diabetic group (4.7±1.4 vs 3.2±1.5; p<0.001). During a 2 year-follow up period, we collected 27 (3.0%) ischemic stroke. As expected, the rates of stroke were significantly higher in diabetic NVAF (7.6% vs 2.3%, p<0.001). Also, the ABG was significantly greater in NVAF who had an ischemic stroke compared to others (160±68 mg/dL vs 119±39 mg/dL, p=0.005). The incidence of stroke was almost five-time greater in NVAF with ABG level major than 150 mg/dl (9.8% vs 1.9%, p<0.001).

At multivariate Cox-regression model adjusted for age, sex and presence of T2DM, blood glucose level at admission was the only independent predictor of ischemic stroke at follow up (HR 1.01, 95% CI 1.001–1.02; p=0.03). Finally, another multivariate Cox-regression model, adjusted for the mean CHA2DS2-VASc score, showed that the ABG level still remained a strong independent predictor of ischemic stroke at follow up (HR 1.012, 95% CI 1.003–1.02; p=0.01).

Conclusions: Diabetic NVAF had a worse baseline profile and higher stroke risk compared to non-diabetic NVAF. Baseline blood glucose level was an independent predictor of stroke regardless of the presence of T2DM or stroke risk profile. These findings underline the role of basal blood glucose level as a potential stroke risk modifier and therefore emphasize the importance of its routine determination to better stratify the stroke risk in NVAF starting DOACs.