Impact of Age on Thromboembolic Events in Patients with Non-valvular Atrial Fibrillation

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**Introduction**: Age is a well-established risk factor for thromboembolic events in patients with atrial fibrillation (AF). However, the mechanism underlying the association between age and thromboembolic events in AF remains unknown. We aimed to investigate the value of age as a risk factor for thromboembolic events as compared to other risk factors constituting the CHA2DS2-VASc score.

**Methods**: The prognostic value of age as a risk factor for thromboembolic events was analyzed using data from the Korean National Health Insurance Service (NHIS). In a large-scale single-center registry, cardiac hemodynamic parameters were examined to elucidate the cause of increased risk of thromboembolic events in older patients.

**Result**: NHIS sample cohort data including 5,896 patients with AF revealed that the risk of thromboembolic complication differed significantly according to age despite equal CHA2DS2-VASc score. In the registry of 2,801 patients, age showed significant correlations with left atrium (LA) diameter, LA volume, E/e’, pulmonary artery pressure, and LA appendage flow velocity. Older patients had a significantly higher prevalence of spontaneous echocontrast (odds ratio [OR] = 1.030; p < 0.001). Age (OR = 1.031; p < 0.001), E/e’ (OR = 1.065; p = 0.004), and LA appendage flow velocity (OR = 0.988; p = 0.009) were significant predictors for thromboembolic events in multivariate analyses. In both data from the NHIS and the registry, CHA2DS2-VASc score did not outperform age to predict thromboembolic events.

**Conclusion**: Age is a significant risk factor for thromboembolic events in patients with AF, and old age is associated with adverse cardiac hemodynamics. This study suggests that older patients with AF are at high risk of thromboembolic events regardless of CHA2DS2-VASc score.