Anti-arrhythmic drugs confer increased risks of bradyarrhythmia in patients undergoing direct current cardioversion for atrial fibrillation

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Background: Bradyarrhythmia is a known complication to direct current cardioversion (DC-cardioversion) in patients with atrial fibrillation (AF). However, whether concomitant treatment with anti-arrhythmic drugs (AADs) is associated with an increased risk of bradyarrhythmia in relation to the procedure is unknown.

Purpose: To investigate the short-term risk of bradyarrhythmia associated with AAD treatment in AF patients undergoing DC-cardioversion.

Methods: Using Danish nationwide registers, all AF patients treated with either an AAD (amiodarone, sotalol, dronedarone, flecainide, or propafenone) or rate-lowering drugs (beta-blocker, non- dihydropyridine calcium-antagonist, or digoxin) were identified at their first DC-cardioversion between 2001 and 2016. Patients were excluded if they were under 18 or above 100 years of age or had a pacemaker or implantable cardioverter defibrillator. The event of interest was a composite outcome of either a diagnosis of bradyarrhythmia (sinoatrial arrest, atrioventricular block, or unspecified bradycardia) or a procedure of pacemaker implantation. Patients were followed from the date of DC-cardioversion until event of interest, 90 days after the procedure, or at study end. Absolute risks of bradyarrhythmic events were estimated using the Aalen-Johansen estimator taking the competing risk of death into account. Hazard ratios (HR) with 95% confidence intervals (95% CI) of bradyarrhythmic events were computed using multivariable Cox models adjusted for age, sex, calendar year, as well as relevant comorbidity and concomitant medication.

Results: A total of 22,344 patients were included in the study with 3,224 (14%) individuals treated with an AAD. The median age was 67 years (interquartile range [IQR] 59–73) and most were males (69%). Patients treated with AADs were younger and had more ischemic heart disease, heart failure, and valvular disease. During follow-up we identified 601 cases of bradyarrhythmia. We found an absolute risk of bradyarrhythmic events at 90 days after cardioversion of 3.7% (95% CI 3.1–4.4) for patients treated with an AAD and 2.5% (95% CI 2.3–2.7) for patients treated with rate-lowering drugs (P<0.001) (Figure 1). AAD treatment conferred increased rates of bradyarrhythmia with a multivariable adjusted HR of 1.35 (95% CI: 1.10–1.65) compared to patients treated with rate-lowering drugs.

Conclusion: Using a large nationwide study population of patients with AF undergoing DC-cardioversion, concomitant treatment with AADs was associated with an increased risk of bradyarrhythmic events. Moreover, the absolute risks of bradyarrhythmic events after DC-cardioversion were higher than what has previously been reported. These data provide valuable insights aiding physicians in clinical decision making as well as informing patients prior to the procedure.

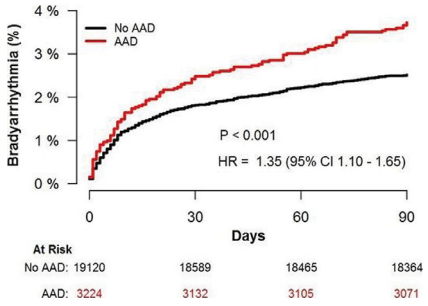

Figure 1. Absolute risk and adjusted hazard ratio (HR) of bradyarrythmia. AAD: Anti-arrhythmic drugs. CI: Confidence Interval.