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Permanent atrial fibrillation development in patients with DDD pacemaker -Risk factors and association with mortality in long-term

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Background: In patients undergoing permanent DDD cardiac pacing, the maintenance of atrial contractility is important to ensure adequate ventricular filling and to guarantee an optimal ventricular ejection capacity. Atrial fibrillation (AF) is a major risk factor for thromboembolic events and is associated with increased cardiovascular and all-cause mortality.

Purpose: To analyse the risk factors for development of permanent AF in patients with DDD pacemaker and determine its association with all-cause mortality in long-term follow-up.

Methods: Retrospectively collected records comprised all consecutive patients who underwent primary DDD pacemaker implantation at single-centre between 1984–2014. Patients who were lost to follow-up after hospital discharge were excluded from analysis. Follow-up was completed on 31st August 2016. Definition of permanent AF was the occurrence of AF which persisted until the end of follow-up. Data on patients' survival status and deceased patients' dates of death were collected from the national death registration system. Information of death date was available as of 31st August 2016. The endpoint was all-cause mortality.

Results: We included a total of 3771 patients and 24,432 patient-years of follow-up and excluded 157 (4%) patients who were lost to follow-up after hospital discharge. Mean follow-up was 78 ± 62 months (max. 370 months), 1761 (47%) were female. Paroxysmal AF prior to DDD pacemaker implantation was detected in 1276 patients (34%). During entire follow-up 717 (19%) patients developed permanent AF in a mean period of 55 ± 50 months. Analysis of risk factors for development of permanent AF is presented in Figure. Cox proportional hazards model with time-dependent covariate showed that development of permanent AF significantly increased mortality during follow-up (HR = 1.885, 95% CI, 1.654–2.148, $P < 0.001$; with adjustment for age at implantation and sex: HR = 1.475, 95% CI, 1.294–1.682, $P < 0.001$).

Conclusions: Female sex protected against permanent AF development, whereas age at implantation, history of paroxysmal AF and apical position of RV lead increased the risk. Permanent AF was significantly increasing the all-cause mortality, even after adjustment for age at implant and gender.

