

Atrial fibrillation – on its trigger mechanisms, risks and consequences

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av

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The thesis is based on the following papers:

- I. Poçi D, Abrahamsson B-M, Bergfeldt L, Edvardsson N. **Burden and timing of premature atrial contractions after electrical cardioversion of persistent atrial fibrillation do not predict its recurrence.** *Clin Cardiol.* 2008;31:492-7.
- II. Poçi D, Abrahamsson B-M, Edvardsson N, Bergfeldt L. **Transient impairment of sinus node function immediately after electrical cardioversion of persistent atrial fibrillation.** *Submitted.*
- III. Poçi D, Backman L, Karlsson T, Edvardsson. **New or aggravated heart failure during long-term right ventricular pacing after AV junctional catheter ablation.** *Pacing Clin Electrophysiol.* 2009;32:209-16.
- IV. Poçi D, Hartford M, Karlsson T, Caidahl K, Edvardsson N. **Short-term and long-term prognosis in relation to type of atrial fibrillation in patients with acute coronary syndromes.** *In manuscript.*
- V. Poçi D, Hartford M, Karlsson T, Herlitz J, Edvardsson N, Caidahl K. **Role of the CHADS₂ score in acute coronary syndromes – risk of subsequent death or stroke in patients with and without atrial fibrillation.** *Submitted.*



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ABSTRACT

Background:

Atrial fibrillation (AF) frequently impairs quality of life, but in long-term it is associated with an increased morbidity and mortality. Persistent AF may cause changes in the sinus node function, and if converted to sinus rhythm (SR), there is a substantial risk of recurrence of AF. Atrioventricular junctional ablation (AVJA) is a therapeutic option for patients with drug refractory persistent/permanent AF, but permanent right ventricular pacing after ablation, according to some reports, has been associated with the development of heart failure (HF).

Methods:

172 patients with persistent AF underwent elective DC cardioversion and analysis of 5 minutes ECG recordings was made in those converted to sinus rhythm (SR). Another 213 patients were followed for 6±3 years after AVJA. Forty-nine of the patients (23%) were known to have HF before AVJA, and aggravated or new HF was in long-term followed. Of 2335 consecutive patients admitted with acute coronary syndromes (ACS), 442 had known AF (n=204), new AF at admission (n=54) or developed new AF during hospitalization (n=184). The short- and long-term mortality and morbidity were followed in patients with and without AF, and were related to their CHADS₂ scores at admission.

Results:

After successful cardioversion of persistent AF, 30% of the patients had a recurrence of AF within 1 week. Premature atrial contractions (PAC) were equally frequent in patients with and without AF recurrence. A low sinus rate and/or sinus pauses >2 s were observed in 31 patients in the first few minutes but did not predict recurrence of AF. One quarter of the patients with known HF before AVJA showed an aggravation of HF, while 13% developed new symptoms of HF during long-term right ventricular pacing after AVJA. High age and low EF were independent predictors of new HF, while high age and coronary artery disease were independent predictors of all-cause mortality. In patients with ACS and AF, short-term mortality (<30 days) was 13.8%, and differed significantly between the AF subgroups. All-cause 10-year mortality did not differ between subgroups, as opposed to the rate of hospitalization for stroke. The all-cause mortality at 10-years showed a strong association with the CHADS₂ scores both in patients with and without AF, although strongest in patients without AF (hazard ratio [HR] and 95% confidence interval per unit increase in the six-graded CHADS₂ score 1.53 [1.42-1.64], p<0.0001 vs 1.28 [1.16-1.43], p<0.0001 after adjustment for potential confounders).

Conclusions:

PACs and transient sinus bradycardia were the most common potential trigger mechanisms after cardioversion of persistent AF, but they did not predict recurrences of AF. AVJA followed by right ventricular pacing was associated with aggravated HF in a quarter of patients with previously known HF, while development of new symptoms of HF occurred much less often. In patients with ACS the type of AF influenced the 30-day mortality and the long-term risk of hospitalization for stroke. The CHADS₂ score helped to identify patients with a higher risk for subsequent stroke and death, both in patients with and without AF.

Key words: Acute coronary syndromes, atrial fibrillation, AV junctional ablation, CHADS₂ score, electrical cardioversion, mortality, stroke, trigger mechanisms.