Atrial Fibrillation in Cardiac Surgery

av

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Akademisk avhandling

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Abstract

Atrial fibrillation (AF) is the most common arrhythmia seen in clinical practice. In cardiac surgery, one-third of the patients experience episodes of AF during the first postoperative days (postoperative AF), and patients with preoperative AF (concomitant AF) can be offered ablation procedures in conjunction with surgery, in order to restore ordinary sinus rhythm (SR). The aim of this work was to study the relation between postoperative AF and inflammation; the long-term consequences of postoperative AF on mortality and late arrhythmia; and atrial function after concomitant surgical ablation for AF.

In 524 open-heart surgery patients, C-reactive protein (CRP) serum concentrations were measured before and on the third day after surgery. There was no correlation between levels of CRP and the development of postoperative AF.

All 1,419 patients with no history of AF, undergoing primary aortocoronary bypass surgery (CABG) in the years 1997–2000 were followed up after 8.0 years. The mortality rate was 191 deaths/1,000 patients (19.1%) in patients with no AF and 140 deaths/419 patients (33.4%) in patients with postoperative AF. Postoperative AF was an age-independent risk factor for late mortality, with a hazard ratio (HR) of 1.56 (95% CI 1.23–1.98). Postoperative AF patients had a more than doubled risk of death due to cerebral ischaemia, myocardial infarction, sudden death, and heart failure compared with patients without AF.

All 571 consecutive patients undergoing primary CABG during the years 1999–2000 were followed up after 6 years. Questionnaires were obtained from 91.6% of surviving patients and an electrocardiogram (ECG) from 88.3% of all patients. In postoperative AF patients, 141 patients (74.1%) had AF at follow-up, compared with 2.8% of patients with no AF at surgery ($p<.001$). An episode of postoperative AF was found to be an independent risk factor for development of late AF, with an adjusted risk ratio (RR) of 3.11 (95% CI 1.41–6.87).

Epicardial microwave ablation was performed in 20 open-heart surgery patients with concomitant AF. Transthoracic echocardiography was performed preoperatively and at 6 months postoperatively. At 12 months postoperatively, 14/19 patients (74%) were in SR with no anti-arrhythmic drugs. All patients in SR had preserved left and right atrial filling waves (A-waves) and Tissue velocity echocardiography (TVE) showed preserved atrial wall velocities and atrial strain.

In conclusion, postoperative AF is an independent risk factor for late mortality and late development of AF. There is no correlation between the inflammatory marker CRP and postoperative AF. Epicardial microwave ablation of concomitant AF results in SR in the majority of patients and seems to preserve atrial mechanical function.

Keywords: Atrial fibrillation, Inflammation, CABG surgery, Survival analysis, Follow-up studies, Ablation, Microwave, Transmurality, Atrial function, Tissue velocity echocardiography.