Incidence of Cerebral Embolism After Cardioversion of Atrial Fibrillation

Cardioversion and Thrombosis in Atrial Fibrillation

Incidence of Cerebral Embolism After Cardioversion of Atrial Fibrillation: A Prospective and Serial Study Using Magnetic Resonance Imaging

Harald Schmidt, Peter Bernhardt, Christoph Hammerstingl, Stefan Illien, Christina Münßl, Torsten Sommer, Berndt Lüdtner, Heyder Oman, University of Bonn, Bonn, Germany

Background: The incidence of clinical apparent cerebral embolism in patients (pts) with atrial fibrillation (AF) who underwent transesophageal echocardiographical (TEE) guided cardioversion is approximately 1%. The incidence of clinically silent cerebral embolism has not been analyzed yet. The aims of this prospective study were (1) to evaluate the prognosis of cardioversion in pts with AF and (2) to assess the incidence of cerebral embolism with MR-Imaging (MRI).

Methods: The study group consisted of 102 pts with AF and TEE guided cardioversion. To document the incidence of cerebral embolism all pts received oral anticoagulation therapy (an INR > 2 was defined as effectively anticoagulated), neurological assessment and cranial MRI including diffusion-weighted imaging within <48h before and 4 weeks after the procedure.

Results: 16 (70%) pts had sinus rhythm in the 4 weeks follow-up assessment. There were no clinical apparent cerebral embolism. 2 (2%) pts had acute cerebral microembolism in the MRI during the follow-up period. 58 (58%) pts were effectively anticoagulated during the observation period. One patient with acute cerebral lesion in the MRI was not effectively anticoagulated.

Conclusions: The incidence of clinically silent embolism after TEE guided cardioversion in pts with AF under continued effective anticoagulation is low. The findings of this study support the safety of the TEE guided approach to cardioversion in AF patients.

Incidence of Cerebral Embolism in High-Risk Patients With Atrial Fibrillation

Harald Schmidt, Peter Bernhardt, Christoph Hammerstingl, Matthias Hackenberg, Torsten Sommer, Berndt Lüdtner, Heyder Oman, University of Bonn, Bonn, Germany

Background: Patients (pts) with atrial fibrillation (AF) and spontaneous echo contrast (SEC) have an increased stroke risk. The purpose of this prospective study was (1) to evaluate the prognosis of pts with dense SEC and (2) to assess the incidence of cerebral embolism with MR-Imaging (MRI) under continued oral anticoagulation therapy. Methods: The study group consisted of 64 pts with SEC and AF. 28 pts served as controls. All pts received oral anticoagulation therapy during the follow-up period (an INR > 2 was defined as effectively anticoagulated). To document the incidence of cerebral embolism all pts underwent the following examinations at admission and at 1, 3 and 12 months: transthoracic and transesophageal echocardiography, cranial MRI including diffusion-weighted MRI, assessment of the anticoagulation level and neurological assessment.

Results: 2 pts had clinically silent cerebral embolism at the index examination. Two patients (3%) had cerebral embolism with neurological deficit during the follow-up period. Four (6%) pts died during the observation period due to stroke. Additionally, 6 (9%) pts had new appeared focal diffusion abnormalities in the MRI during the follow-up. 45 (70%) pts were effectively anticoagulated, 16 (23%) pts were anticoagulated inadequately during the 12 months. Pts with cerebral embolism had lower left atrial appendage peak velocities (0.22 ± 0.14 vs. 0.38 ± 0.21; p<0.01) and denser SEC (2.6 ± 1.1 vs. 1.6 ± 1.4; p<0.01) than pts without cerebral events.

Conclusions: Pts with AF and SEC have an increased risk of cerebral embolism despite oral anticoagulation therapy. Low peak empty velocities of the left atrial appendage and dense SEC are echocardiographic predictors for a cerebral event.

Endothelial, Coagulation, and Platelet Function in Atrial Fibrillation: Effect of Direct Current Cardioversion

Fraser Wilhove, Neil Grubb, Christopher Ludlam, Keith A. Fox, Andrew D. Flapan, Cardiovascular Research, Edinburgh, United Kingdom

Background: Atrial fibrillation (AF) is the most common human arrhythmia with a prevalence in the elderly population of up to 15%. It results in breathlessness, palpitations and systemic embolisation due to a procoagulant state. Recent studies of AF have suggested that rate control with anticoagulation may have a superior outcome compared to rhythm control. The aim of this study was to assess the effect of D.C. cardioversion on markers of coagulation and platelet activity and endothelial function in patients with AF on warfarin therapy.

Methods: Sixty patients undergoing elective D.C. cardioversion for non-valvular atrial fibrillation were recruited to the study. All patients were taking warfarin aiming for an INR of 2-3. D.C. cardioversion was performed under general anaesthetic following our local protocol. Peripheral venous blood was sampled through a 16G needle prior to cardioversion and at 24, 48 and 10 weeks post cardioversion. The samples were assayed for INR, prothrombin fragment 1+2, d-dimer, beta-thromboglobulin and von Willebrand factor.

Results: Nine patients failed to cardiovert to sinus rhythm, and 8 people withdrew from the study. The median age of the study group was 65 (39-77) years. Mean INR was 2.4 (±0.3). At 2 weeks, 20 patients remained in SR and 23 had reverted to AF. Compared to baseline, D.C. cardioversion produced no significant change in prothrombin fragment 1+2 (p=0.1), d-dimer (p=0.3), beta-thromboglobulin (p=0.5), or von Willebrand factor (p=0.6).

Conclusions: Pts with AF and SEC have an increased risk of cerebral embolism despite oral anticoagulation therapy. Low peak empty velocities of the left atrial appendage and dense SEC are echocardiographic predictors for a cerebral event.