

Predictive value of diabetes mellitus for freedom from arrhythmia recurrence after cryoballoon-guided pulmonary vein isolation

Guckel D.¹; Isgandarova K.¹; Bergau L.¹; El Hamriti M.¹; Imnadze G.¹; Braun M.¹; Khalaph M.¹; Lee-Barkey YH.²; Tschoepe D.²; Sommer P.¹; Sohns D.¹

¹Clinic for Electrophysiology, Herz- und Diabeteszentrum NRW, Ruhr-Universität Bochum, Bad Oeynhausen, Germany

²Diabetes Center, Herz- und Diabeteszentrum NRW, Ruhr-Universität Bochum, Bad Oeynhausen, Germany

Funding Acknowledgements: Type of funding sources: None.

Background: Diabetes mellitus (DM) has been identified to play an important role in the regulation of atrial fibrillation (AF). Data concerning the impact of DM on the development of individual arrhythmia substrates are still lacking.

Purpose: Therefore, the primary aim of this study was to examine the outcome of cryoballoon-guided pulmonary vein isolation (PVI) in patients (pts) suffering from DM and coexisting AF.

Methods: 523 consecutive pts undergoing initial PVI using the 2nd generation cryoballoon were analysed. 273 pts (52%) suffered from paroxysmal AF (PAF) (51 ± 23.2 years old, 26% female), 250 pts (48%) from persistent AF (PERS) (63.9 ± 10.0 years old, 30% female) and 69 pts (13%) were diagnosed with DM (68 ± 19.6 years old, 30% female). Follow-up (FU) visits were performed at 3, 6 and 12 months including 7-day Holter ECGs. Primary endpoint was the first documented recurrence of any atrial arrhythmia after a 3 months blanking period (> 30 sec.).

Results: Within the observation period of 12 months AF recurrence occurred in 29% (n = 151 pts). Regardless of the coincidence of DM, PAF pts were significantly younger than those with PERS (p = 0.001). PAF pts additionally suffering from DM presented with a significantly higher risk for arrhythmia recurrence (p = 0.047). Multivariate analyses verified DM as a strong independent predictor for arrhythmia recurrence associated with a > 4 fold higher risk for recurrence after ablation (p = 0.009, hazard ratio (HR) 4.363, confidence interval (CI) 1.46-13.07). PERS pts showed a slightly increased rate of arrhythmia recurrence when additional DM was diagnosed. In these patients multivariate analyses revealed that DM was associated with a 43% higher risk for arrhythmia recurrence (p = 0.321, HR 1.143, CI 0.59-2.22). Beyond that, severe gender disparities were observed with female gender as independent predictor for arrhythmia recurrence (p = 0.027*, HR 1.927, CI 1.079-3.440).

Conclusions: DM has relevant implication for arrhythmia recurrence after PVI. More distinct effects were observed in PAF patients following AF ablation. This could be related to more severe arrhythmia substrates in PAF pts suffering from DM compared to PAF pts without additional DM and even more substantial structural changes in PERS. Thus, individual paths in ablation management are required in these pts with AF and coexisting DM.