Impact of diabetes mellitus severity, treatment regimen and glycaemic control on atrial fibrillation prevalence. A report from the NOMED-AF prospective cross-sectional observational study

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Introduction: Diabetes mellitus (DM) is a well-known risk factor for atrial fibrillation (AF), but the mechanism(s) by which DM affects AF prevalence remains unclear. The pathophysiological background underlying the frequent coexistence of diabetes and AF seems to be multifactorial, involving changes in left atrial size, abnormal proinflammatory mediators and endothelial dysfunction.

Purpose: This study aims to evaluate the impact of diabetes mellitus severity, expressed as its known duration, antihyperglycemic treatment regimen and glycaemic control reflected by HbA1c level on AF and its silent, asymptomatic form (SAF) prevalence.

Methods: The cross-sectional NOMED-AF trial schedule comprised multistage, stratified and clustered population sampling with subsequent clinical evaluation and long-term non-invasive AF screening. AF was screened using a telemonitoring vest for a mean of 21.9 ± 9.1 days. From the representative sample of 3014 participants (mean age 77.5, 49.1% female), 881 participants (mean age 77.6 ± 0.25, 46.4% female) with concomitant DM were involved in the analysis.

Results: The mean DM duration was 12 ± 0.35 years, but no significant impact of DM timespan on AF and SAF prevalence was observed. There were also no differences in the course of DM treatment pattern (oral medication vs insulin vs both - oral + insulin) among the study population with and without concomitant AF (p=0.106). From the study population 72% (95% CI: 68.7-75.1) received only oral hypoglycaemic medication; 12.9% (95% CI: 10.7-15.5) was taking both oral treatment + insulin injections; and 15.1% (95% CI: 12.7-17.8) were administered with insulin only. Metabolic control reflected by HbA1c levels showed no significant association with AF prevalence (p=0.635; p=0.094).

On multivariate analyses, age (Odds Ratio (OR) 1.35, 95%CI: 1.18-1.53, p<0.001), body mass index (BMI; OR 1.043, 95%CI: 1.01-1.08, p=0.027) and LDL<100 mg/dl (OR 0.64, 95%CI: 0.42-0.97, p=0.037) were independent risk factors for AF prevalence, while age (OR 1.45, 95%CI: 1.20-1.75, p<0.001), LDL<100 mg/dl (OR 0.43, 95%CI: 0.23-0.82, p<0.011), use of statins (OR 0.51, 95%CI: 0.28-0.94, p=0.031) and HbA1c ≤6.5 (OR 0.46, 95%CI: 0.25-0.85, p=0.013) were associated with silent AF prevalence.

Conclusions: Diabetes duration, diabetic treatment pattern or metabolic control per se did not significantly impact the prevalence of AF, including silent AF detected by prospective continuous monitoring. Independent predictors of AF were age, BMI and low LDL levels, with statins and HbA1c ≤6.5 being additional independent predictors for SAF.