

and clinical outcomes but it has not been investigated as a measure of outcomes in atrial fibrillation (AF) patients.

Methods We performed a post-hoc analysis of the AFFIRM trial including patients with available echo data. Patients were stratified based on gender-adjusted echo derived interventricular septal (IVS) thickness, relative wall thickness (RWT), gender-adjusted LV mass and type of LV remodelling (normal LV geometry, concentric hypertrophy, eccentric hypertrophy, and concentric remodelling). Cox proportional hazards models were used for multivariate analyses of time to death and time to ischaemic stroke.

Results Of 4060 patients recruited in AFFIRM, sufficient echo data were available in 2433 patients (60%). Multivariate analysis showed that moderate-severe LV (IVS diastolic dimension >1.2 cm for women, >1.3 cm for men) was associated with all cause mortality (HR 1.45, 95% CI 1.13 to 1.86, $p=0.003$). Concentric LV hypertrophy was associated with the worst outcome (defined as $RWT>0.42$ and LV mass >224 g for men or LV mass >162 g for women) ($p=0.008$ vs, normal geometry—defined as $RWT \leq 0.42$ and LV mass ≤ 224 g for men or LV mass ≤ 162 g for women). In a multivariate model, including established clinical, demographic and echo risk factors, moderate-severe LV hypertrophy assessed by IVS thickness was the strongest echo predictor of stroke (HR 2.2, 95% CI 1.3 to 3.7, $p=0.002$).

Conclusion In the AFFIRM Trial, LV hypertrophy assessed by gender-adjusted IVS thickness is an important risk factor for ischaemic stroke in patients with AF. LV hypertrophy assessed by gender-adjusted IVS thickness is associated with increased all cause mortality in AF patients.

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SUCCESSFUL APPLICATION OF A NOVEL RESTITUTION GRADIENT BASED MARKER OF VENTRICULAR ARRHYTHMIA TO PATIENTS WITH NON-ISCHAEMIC CONDITIONS

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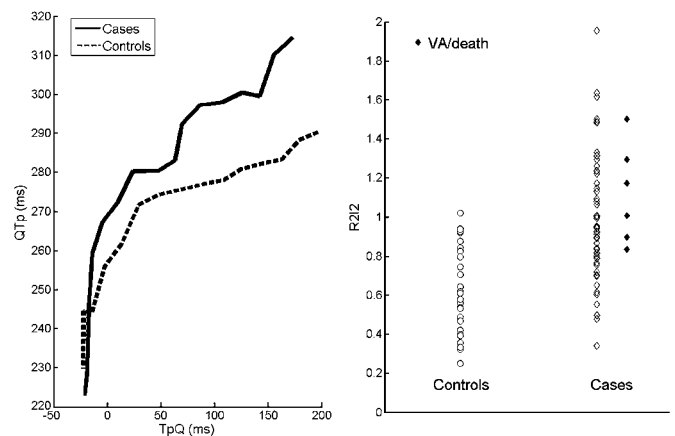
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Background There are major limitations with Sudden Cardiac Death (SCD) risk assessment, especially in patients without ischaemic heart disease (IHD). Electrical restitution, that is, the relationship between action potential duration (APD) and preceding diastolic intervals (DI), is regarded as key to the initiation of ventricular arrhythmias (VAs). We have developed a novel measure of APD restitution heterogeneity based on 12-lead ECG recordings: Regional Restitution Instability Index (R2I2), and shown it to be predictive of VA/death in patients with established myocardial infarcts.¹ This data represents the first application of R2I2 to patients at risk of SCD with non-ischaemic aetiologies.

Method A blinded retrospective study of 57 patients without IHD [Cases], undergoing ventricular tachycardia stimulation studies as SCD risk stratification for ICD, and 29 patients with structurally normal hearts [Controls] undergoing electrophysiology studies for supraventricular arrhythmias. Cases consisted of: 33 patients with dilated cardiomyopathy, 12 Brugada syndrome, 4 non-compaction cardiomyopathy, 3 myotonic dystrophy, 2 arrhythmogenic right ventricular dysplasia, 1 hypertrophic cardiomyopathy and 1 cardiac sarcoidosis. During programmed stimulation, surrogates of APD and DI were obtained from a high resolution surface ECG recording. Restitution curves were plotted with gradients for each lead calculated using overlapping least-squares linear segments.² APD restitution gradient heterogeneity was measured and quantified as R2I2 (mean of the SD of the residuals from the mean at each segment for each ECG lead).

Results R2I2 was significantly higher in Cases compared to Controls (mean \pm SEM: 0.98 ± 0.04 vs 0.63 ± 0.04 , $p<0.001$) (scatter plot). Six Cases reached the endpoint of VA/death (mean follow-up 5.2 years). There was a non-significant trend towards higher R2I2 in patients experiencing VA/death (1.12 ± 0.10 vs 0.96 ± 0.05 , $p=0.27$). The graph shows the mean cutaneous restitution curve for all leads and all patients, steeper curves with longer QTp (APD) were seen in the Case group.

Conclusion The R2I2 was higher in patients at risk of SCD than controls. Use of cutaneous surrogates to quantify APD restitution heterogeneity and assess risk of SCD shows promise in patients with non-ischaemic aetiologies.



Abstract 055 Figure 1

REFERENCES

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LEUCOCYTE TELOMERE/TELOMERASE DYNAMICS IN PATIENTS WITH IMPLANTABLE CARDIOVERTER DEFIBRILLATOR; POTENTIAL BIOMARKER FOR VENTRICULAR ARRHYTHMIAS

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Introduction Implantable cardioverter defibrillators (ICDs) have been shown to reduce mortality in patients with ischaemic cardiomyopathy at a high risk of ventricular arrhythmias (VA), which are the commonest cause of sudden death. However, ICDs are associated with morbidity and mortality. Importantly 67% of patients never receive an appropriate shock after ICD implantation under the current indication, suggesting a need for better risk stratification tools. Telomere and telomerase in leucocytes have recently been shown to correlate with biological aging, health status, and also with pathogenesis/prognosis of various cardiovascular diseases. We hypothesise that the leucocyte telomere length and/or telomerase activity correlate with the incidence of VA in ischaemic cardiomyopathy patients.

Methods 73 ischaemic cardiomyopathy Caucasian patients with primary prevention ICDs were recruited to this retrospective study between October 2010 and January 2011 at St Bartholomew's Hospital. Concentrated leucocyte fraction was obtained from venous blood sample of recruited patients and stored at -80°C in an