Cardiovascular Magnetic Resonance in Survivors of Sudden Cardiac Arrest - 14 Year Experience from a Tertiary Referral Centre in the United Kingdom

Category: Arrhythmia and Clinical EP

Keywords: Sudden cardiac death; Ventricular fibrillation; Magnetic resonance imaging


Background: Sudden cardiac death arises from a spectrum of age-related cardiovascular disease demonstrated on autopsy-based studies (Finocchiaro et al 2016). However, in survivors of sudden cardiac arrest (SCA), cardiovascular magnetic resonance (CMR) facilitates in-vivo tissue characterisation directly relevant to patient management but not supported by current guidelines.

Method: CMR data from consecutive patients (2002-2016) referred within 6 months of aborted SCA were retrospectively reviewed.

Results: Of 397 patients (age 50±18yrs, 59% male) undergoing contrast enhanced CMR, rhythm disturbances were ventricular fibrillation (62%), ventricular tachycardia (8%), pulseless electrical activity/asystole (4%) and unknown (26%). In patients ≤35yrs of age (n=87), the study was normal in 52%. The most common diagnoses were dilated cardiomyopathy (14%) and acute myocarditis (10%). In patients >35yrs (n=310), myocardial infarction was found in 32% and a normal study in 26%. Late gadolinium enhancement was present in 22% ≤35yrs compared to 78% >35yrs, including 7% in both groups with an otherwise normal study.

Conclusion: Despite varying time intervals from SCA to CMR within a single centre, age-related CMR findings were similar to previous autopsy-based studies. CMR was able to robustly exclude structural abnormalities and effectively identify potential arrhythmic substrates such as acute myocarditis and myocardial fibrosis in vivo with important diagnostic and management implications.
CMR findings in survivors of sudden cardiac arrest in all subjects (A), further subdivided into ≤35 years and >35 years of age (B). The subgroup classified as ‘other’ is composed of the diagnoses listed in figure A with a frequency of <2% in this cohort.