Supplement data

Supplemental 1: FDG-PET protocol

FDG-PET imaging was performed following detailed dietary preparation to suppress physiological myocardial glucose uptake including a 24-hour high-fat and high protein, no-carbohydrate diet followed by 18 hours of fast. First a resting gated myocardial perfusion scan was performed with Rubidium-82 PET. FDG-PET imaging was performed on the same day after checking patient adherence to the protocol and blood glucose levels. After IV injection of ^{18}F-FDG (3MBq/Kg) and an uptake period of 90 min, a half body PET scan was performed with low-dose CT imaging (Siemens mCT flow, Siemens Healthcare, Germany) for attenuation correction. This included longer scan time over heart for more detailed evaluation. FDG images were analysed using MIMCardiac (MIM Software Inc, Cleveland, Ohio) and perfusion images analysed using QGS+QPS (Cedars-Sinai Medical Centre). All images were reviewed in our multidisciplinary team meeting involving Nuclear Medicine (KW) and cardiac magnetic resonance (CMR) imaging (AJB) specialists. Studies deemed diagnostic failures due to poor suppression of physiologic glucose uptake were repeated following 48-hour dietary preparation. This included scans with diffuse FDG-uptake scans with no associated perfusion defect(s) with intense FDG-uptake isolated to the lateral wall with no associated perfusion defect. Patients with studies that still showed diagnostic failure despite this, were excluded from the final analysis.

Supplemental Table 1: Heart Rhythm Society 2014 Diagnostic Criteria and breakdown of imaging findings	**Number of patients [N= 208] n, (%)**
Biopsy proven cardiac sarcoidosis	2 (1%)
Biopsy proven extracardiac sarcoidosis with cardiac manifestations	206 (99%)
Cardiac Manifestations	
Corticosteroid responsive cardiomyopathy or heart block	0 (0%)
Unexplained reduced LVEF (<40%)	44 (21%)
Unexplained sustained ventricular tachycardia	19 (9%)
Mobitz II second degree or third-degree heart block	35 (17%)
Patchy uptake on dedicated cardiac PET compatible with CS	163 (78%)
LGE on CMR compatible with CS	194 (93%)
Positive Gallium uptake	Not performed
LGE & PET findings in whole group	
Either LGE+ or PET+	208 (100%)
Both LGE + and PET+	150 (72%)
LGE+ and PET-	44 (21%)
PET+ and LGE-	14 (7%)
LGE & PET findings in unexplained LVEF<40%	N = 44
Either LGE+ or PET+	44 (100%)
Both LGE + and PET+	35 (80%)
LGE+ and PET-	5 (11%)
PET+ and LGE-	4 (9%)
LGE & PET findings in unexplained sustained VT	N = 19
Either LGE+ or PET+	19 (100%)
Both LGE + and PET+	15 (79%)
LGE+ and PET-	3 (16%)
PET+ and LGE-	1 (5%)
LGE & PET findings in advanced AV block	N = 35
Either LGE+ or PET+	35 (100%)
Both LGE + and PET+	27 (77%)
LGE+ and PET-	6 (17%)
PET+ and LGE-	2 (6%)
Combined cardiac manifestations	
AVB + VT	0 (0)
AVB + LVEF <40%	9 (4)
VT + LVEF <40%	5 (2)
AVB = atrioventricular block; CMR = cardiac magnetic resonance; CS = cardiac sarcoidosis; LGE = late gadolinium enhancement; LVEF = left ventricular ejection fraction; PET = positron emission tomography; VT = ventricular tachycardiac	

Supplemental Table 2: Distribution and Patterns of LGE: Comparison of Patients with and without MACE

	Whole group	MACE	No MACE	*P* value
Location of LGE, n(%)				
Basal septum	103 (52%)	27 (68%)	76 (48%)	0.026
Basal inferior	76 (38%)	17 (43%)	59 (37%)	0.530
Basal anterior	38 (19%)	14 (36%)	24 (15%)	0.003
Basal lateral	108 (54%)	21 (53%)	87 (55%)	0.807
Mid septum	66 (33%)	17 (44%)	49 (31%)	0.129
Mid inferior	40 (20%)	13 (33%)	27 (17%)	0.023
Mid anterior	27 (14%)	11 (30%)	16 (10%)	0.002
Mid lateral	57 (29%)	16 (42%)	41 (26%)	0.046
Apical septum	20 (10%)	8 (22%)	12 (8%)	0.011
Apical inferior	27 (14%)	12 (32%)	15 (9%)	<0.001
Apical anterior	26 (13%)	9 (24%)	17 (11%)	0.029
Apical lateral	19 (10%)	9 (24%)	10 (6%)	0.001
LGE distribution, n(%):				
Midwall	89 (46%)	14 (35%)	75 (49%)	0.121
Subepicardial	22 (11%)	6 (15%)	16 (10%)	0.413
Midwall + Subepicardial	33 (17%)	7 (18%)	26 (17%)	0.926
Midwall + Subendocardial	15 (8%)	4 (10%)	11 (7%)	0.547
Transmural	35 (18%)	9 (23%)	26 (17%)	0.410

LGE=late gadolinium enhancement; MACE=major adverse cardiac event(s);

Supplemental figure 1: **All-cause mortality and ventricular arrhythmia (VA) across multimodality imaging parameters.** The Kaplan-Meier curves reveal the frequency of all-cause mortality or VA-free survival according to **(A)** presence of regional wall motion abnormality (RWMA) on TTE, **(B)** right ventricular (RV) dysfunction on CMR, **(C)** thresholds of late gadolinium enhancement (LGE) extent above and below the optimal cut-off point of 15% and **(D)** presence of RV FDG-uptake on PET.