

ABSTRACT HF-564:
Cardiomyopathy Update: Sarcoid, HCM And Pacing Induced Cardiomyopathy

Friday, April 29, 2022
 10:30 AM - 11:30 AM

HF-564-01

READMISSION OUTCOMES IN PATIENTS WITH CARDIAC SARCOIDOSIS

Raheel Ahmed MBBS; Hiroyuki Sawatari; Saurabh A. Deshpande MBBS, MD; Virend Somers MD, PhD; Deepak Padmanabhan; Mohammed Khanji and Anwar A. Chahal BS, MBChB, PhD

Background: Sarcoidosis is a multi-system disorder which can affect the lungs, lymph nodes, liver, spleen, skin, nervous system and the heart. Cardiac sarcoidosis (CS) has historically been under-diagnosed but continues to be associated with significant morbidity and mortality. The most common presenting symptoms include advanced atrioventricular block, ventricular tachycardia (VT) and heart failure (HF).

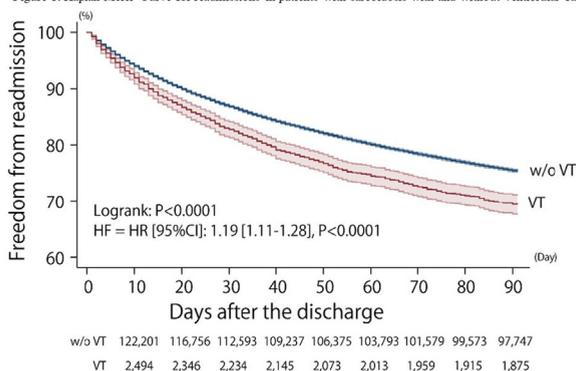
Objective: To evaluate the incidence and impact of VT and HF on the rates of readmissions in patients with a known diagnosis of sarcoidosis using a real-world database.

Methods: Patients with a diagnosis of sarcoidosis with and without admitting symptoms of ventricular tachycardia and/or heart failure from 2010-2017 were abstracted using International Classification of Diseases-9th and 10th Revision-Clinical Modification from the Nationwide Readmissions Database (NRD). All patients > 18 years of age with sarcoidosis were included. We excluded patients who were transferred/died at first admission. Patient demographics, presence of comorbidities and time from discharge to readmission were also evaluated.

Results: During 2010-2017, 124,695 patients with sarcoidosis were included. Ventricular tachycardia (VT) was the presenting complaint in 2,494 (2.0%) patients whilst heart failure was present in 24,794 (19.9%) patients respectively. Readmission was 4.8% higher (24.8% vs 20.0%, $p < 0.0001$) at 90-days follow-up in patients who had initially presented with VT as compared to those who did not initially present with a VT. Similarly, patients with a diagnosis of heart failure and sarcoidosis were more likely to be readmitted within 90-days follow-up as compared to patients with sarcoidosis without heart failure (29.8% vs 17.7%, $p < 0.0001$).

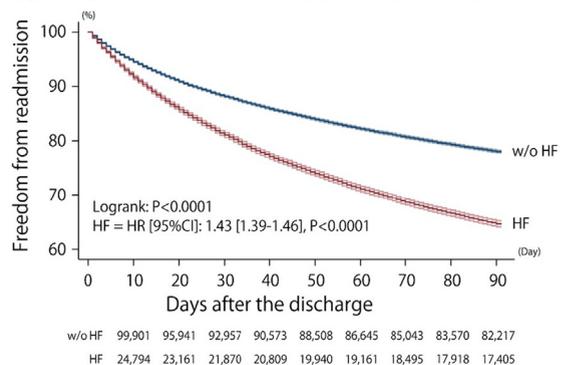
Conclusion: According to this real-world study, sarcoidosis patients initially admitted with HF and/or VT had higher rates of readmissions compared to those without those diagnosis. These data may be an underestimate of consequences of VT and/or HF

Figure 1: Kaplan-Meier Curve for readmissions in patients with sarcoidosis with and without Ventricular Tachycardia



in sarcoid since they reflect a survivor bias. This study highlights the prevalence of cardiac involvement in patients with sarcoidosis requiring admission. Factors accounting for increased readmission should be explored with the aim of improving patient outcomes.

Figure 2: Kaplan-Meier Curve for readmissions in patients with sarcoidosis with and without Heart Failure



HF-564-02

LONG-TERM OUTCOMES OF TACHYCARDIA INDUCED CARDIOMYOPATHY COMPARED WITH IDIOPATHIC DILATED CARDIOMYOPATHY

Moshe Katz MD

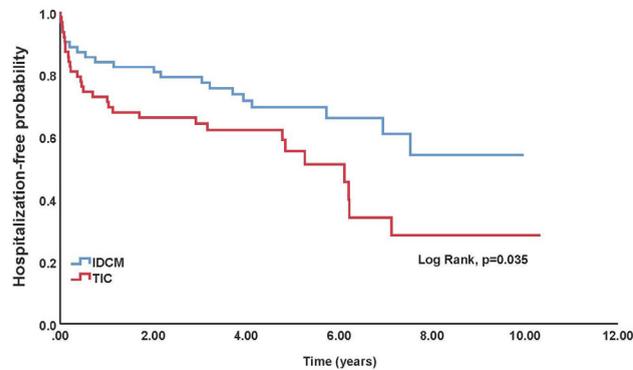
Background: Tachycardia induced cardiomyopathy (TIC) is a reversible dilated cardiomyopathy (DCM). Data on natural course and prognosis of TIC and comparison with other dilated cardiomyopathies is scarce.

Objective: To compare the clinical presentation, comorbidities and long-term outcome of TIC patients with idiopathic DCM patients.

Methods: A single center, retrospective cohort study of patients hospitalized with new onset TIC or IDCM between 2007-2017. The primary end point was composite of death, myocardial infarction, thromboembolic events, assist device or heart transplantation and malignant arrhythmia. The secondary end point was recurrent hospitalization due to worsening heart failure (HF) during follow up. Study end points were evaluated for 5 years and for the whole length of follow up.

Results: 64 TIC and 66 idiopathic DCM (IDCM) patients were enrolled. The primary composite endpoint and all-cause mortality were similar between TIC and IDCM during median follow-up time of ~6 years (36% vs 29% and 22% vs 15%, respectively). A Kaplan-Meier survival analysis showed no significant difference between TIC and IDCM groups for event-free survival of the composite endpoint (Log Rank, $p = 0.328$) and for all-cause mortality (Log Rank, $p = 0.139$). Recurrent admission occurred earlier in TIC patients compared with IDCM patients (Log Rank, $p = 0.035$) and the risk for HF readmission was significantly higher in TIC (HR: 1.81; 95% CI 1.03-3.18). This risk became insignificant after adjustment to comorbidities (HR: 1.55; 95% CI 0.85-2.8). Nonetheless, the incidence of recurrent hospitalization during the follow-up period was significantly higher in TIC patients (incidence rate ratio 1.59, 95% CI 1.12-2.24; $p = 0.009$).

Conclusion: Patients with TIC have similar long-term outcomes as those with IDCM. However, it portends higher rate of HF readmissions, mostly due to arrhythmia recurrences. Further studies are needed to test if early catheter-ablation intervention in TIC can minimize these repeated hospitalizations.



HF-564-03

EFFECT OF SITE-SPECIFIC PACING IN SYMPTOMATIC PATIENTS WITH NON-OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY

Muthiah Subramanian MD; Vijay Shekar MD; Srivechi Chennapragada MD, CCDS; Auras Atreya MD, MPH; Daljeet K. Saggu MBBS, MD; Sachin Dhareppa Yalagudri MD, DM and Calambur Narasimhan MD

Background: Treatment options for symptomatic patients with non-obstructive hypertrophic cardiomyopathy are limited.

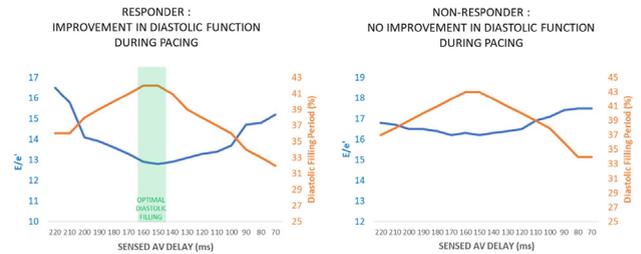
Objective: We studied the effect of dual chamber pacing at different ventricular sites on the diastolic function and functional capacity in patients with nHCM.

Methods: Nineteen patients with symptomatic nHCM and normal LV systolic function were prospectively enrolled. Inclusion criteria included an $E/e' \geq 15$ and an indication for ICD implantation. A Doppler echocardiographic study was performed during sinus rhythm and atrial synchronous ventricular pacing at various atrioventricular (AV) intervals. Pacing was performed at three right ventricular sites: RV apex (RVA), RV mid-septum (RVS), and RV outflow tract (RVO). The site and sensed AV delay (SAD) at which optimal diastolic filling occurred was chosen based on diastolic filling period and E/e' . During ICD implantation, the RV lead was implanted at the site selected by the pacing study. Devices were programmed in DDD mode at the optimal SAD. During follow up, diastolic function and functional capacity (NYHA Class, 6 Minute Walk Distance (6MWD)) were assessed.

Results: Among the 19 patients (age 47.6 ± 7.8 yrs, males 73.9%, ESC SCD Risk $3.9 \pm 0.4\%$), the baseline PR interval, E/A and E/e' were 178.2 ± 19.5 ms, 2.4 ± 0.5 , and 17.2 ± 2.3 , respectively. There was an improvement in diastolic function (E/A, E/e') in 16 patients (responders) when pacing from the RVA (1.5 ± 0.3 , $p < 0.001$; 12.9 ± 3.1 , $p < 0.001$) compared to the RVS (2.2 ± 0.5 , 16.5 ± 2.4) and RVO (2.2 ± 0.4 , 16.8 ± 2.1). There was no improvement in diastolic function in the three other patients (non-responders). In responders, optimal diastolic filling occurred at an AV delay of 130-160ms during RVA. At shorter and longer SAD, there was a worsening of E/e' (Fig). Baseline RBBB (25% vs. 0%, $p = 0.212$) and lower LGE (12.4% vs. 23.2%, $p = 0.004$) were more common among responders. During follow up (9.8 ± 1.8 months), ventricular pacing was $98.3 \pm 1.4\%$. Compared to baseline, there was an improvement (Δ) in diastolic function ($E/A -1.0 \pm 0.3$, $E/e' -4.1 \pm 0.5$), NT proBNP (-51.4 ± 13.2 pg/ml), and functional capacity (NYHA -1.4 ± 0.3 , 6MWD -51.2 ± 6.7 m). There was no change in LVEF during follow up.

Conclusion: In a subset of patients with nHCM, dual chamber pacing from the RVA improved diastolic function and functional capacity.

EFFECT OF DUAL CHAMBER PACING FROM THE RV APEX AT VARIOUS AV DELAYS ON DIASTOLIC FUNCTION



ABSTRACT CA-529:

Mapping Techniques to Elucidate Mechanisms and Aid Ablation Strategy in Atrial Fibrillation Ablation

Friday, April 29, 2022

1:00 PM - 2:00 PM

CA-529-01

RENEWAL THEORY: A STATISTICAL APPROACH TO IMPROVE PATIENT SELECTION FOR PULMONARY VEIN ISOLATION-ONLY STRATEGY IN ATRIAL FIBRILLATION ABLATION

Alvin Quah

Background: Outcomes from pulmonary vein isolation (PVI)-only approach in AF remain suboptimal, especially in persistent AF (persAF) patients. However, results from STAR-AF 2 trial suggest the presence of a subgroup of persAF patients who were responders to PVI-only. While research efforts have primarily focused on which non-PVI ablation techniques to pursue in persAF patients, there has been a paucity of data to define a cohort of AF patients who are "PVI-only responders"

Objective: We recently showed a physiological assessment of fibrillatory dynamics could be performed using renewal theory, which determines rates of phase singularity formation (λ_f) and destruction (λ_d). Using the renewal approach, we aimed to define a cohort of patients who would be responsive to PVI-only approach, independent of the persAF status.

Methods: RENEWAL-AF is a prospective multicentre observational study recruiting AF ablation patients. Unipolar electrograms were obtained from sixteen biatrial locations using a 16-electrode Advisor TM HD-Grid catheter. Renewal rate constants λ_f , λ_d and the rho (ρ) values (λ_f / λ_d) were calculated. All patients had radiofrequency ablation using a PVI-only approach.

Results: N=48 AF patients were recruited (mean age 59.1 ± 9.4 years, 28.5% females). Two groups were analyzed; Phenogroup 1 (Ph1), highest ρ in pulmonary veins, Phenogroup 2 (Ph2), highest ρ in LA body. Ph1 patients had a lower CHA₂DS₂-VASc score ($P = 0.02$), and a smaller LA volume index ($P = 0.04$) compared to Ph2. After a follow-up of 5.15 ± 1.6 months, Ph1 was associated with lower atrial tachyarrhythmia (AT) recurrences ($P = 0.047$) with a lower AF burden ($P = 0.026$). No association was found between persAF status with AF Phenogroup classification ($P = 0.68$), AF burden ($P = 0.58$), or AF recurrence ($P = 0.52$). Additionally, AF Phenogroup was a significant predictor of AF recurrence in both univariate ($\beta +0.32$, 95% CI 0.002 0.64, $P = 0.048$) and multivariate analysis ($\beta +0.34$, 95% CI 0.039 0.65, $P = 0.028$).

Conclusion: Renewal theory approach provides a useful signal-based electrophysiological approach to the assessment of AF fibrillatory dynamics, linked to underlying AF-related clinical risk