THE EFFECT OF METOPROLOL VERSUS CARVEDILOL ON THE RISK OF ATRIAL AND VENTRICULAR ARRHYTHMIA IN PRIMARY PREVENTION IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR RECIPIENTS

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Background: Both selective and non-selective beta-blockers (BB) are used to treat patients with heart failure (HF). However, data on the association of BB type with risk of atrial and ventricular arrhythmia (VA) in HF patients with a primary prevention implantable cardioverter-defibrillator (ICD) are limited.

Objective: To evaluate the effect of metoprolol vs. carvedilol on the risk of atrial and ventricular arrhythmia in HF patients with an ICD.

Methods: The study analysis included 4,354 primary prevention ICD recipients who were enrolled in five landmark ICD trials (MADIT-II, MADIT-CRT, MADIT-RIT, MADIT-RISK, and RAID). A Fine and Gray regression model, stratified by studies, was used to evaluate the risk of fast VA, defined as ventricular tachycardia ≥200 bpm or ventricular fibrillation, and the risk of atrial fibrillation (AF) or supraventricular tachycardia (SVT) by BB type, adjusting for risk factors.

Results: Among 4,354 study patients 2,967 (54%) were prescribed carvedilol and 1,387 (46%) metoprolol. The cumulative incidence of fast VA at 3.5 years was 15% in patients on carvedilol vs. 20% in patients on metoprolol, p = 0.01 (Figure A). Multivariate analysis showed that patients on carvedilol had a 18% lower risk of fast VA (HR [95% CI] = 0.82 [0.69-0.98]; p = 0.031) when compared to those on metoprolol. Similarly, the cumulative incidence of AF or SVT at 3.5 years was 12% in patients on carvedilol vs 15% in patients taking metoprolol, p = 0.003 (Figure B). Multivariate analysis showed that carvedilol treatment was associated with a 35% reduction in the risk of AF or SVT (HR [95% CI] = 0.65 [0.53-0.80]; p < 0.001) when compared to metoprolol.

Conclusion: Our findings suggests that HF patients with ICDs on carvedilol experience a lower risk of fast VA, AF or SVT when compared to those on metoprolol.

THE EFFECT OF ALDOSTERONE ANTAGONISTS ON MORTALITY IN PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION AND ATRIAL FIBRILLATION

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Background: While aldosterone antagonists (AA) have not been shown to improve mortality in heart failure with preserved ejection fraction (HFP EF), their effect on left atrial myopathy could provide benefit in the subgroup of HFP EF patients with atrial fibrillation (AF).

Objective: To determine in the national Veterans Administration (VA) database if there is an effect of AA on mortality in HFP EF patients with AF.

Methods: We identified AF patients with ejection fraction ≥ 40% who were admitted with HF between 2002-2015. Baseline characteristics were determined by ICD-9/10 codes. Ejection fractions were collected from echocardiogram reports and database records. Records were reviewed for 5 years after the index hospitalization. Propensity score matching was used to create balanced groups.

Results: A total of 3,797 patient admitted with HF and had AF at baseline or during follow up were identified - 1,233 (age 69.2 ±
10.2 years, CHA2DS2-VASc 4.9 ± 1.5) and 2,564 (age 73.9 ± 10.5 years, CHA2DS2-VASc 5.2 ± 1.4) treated/not treated with AA. Survival analysis showed a significant mortality reduction with AA adjusting for CHA2DS2-VASc and anticoagulation status (HR 0.65, 95% CI 0.60-0.72, p < 0.001). Using propensity score matching, there was a lower mortality rate in patients treated with AA (Figure – HR 0.80, 95% CI 0.71 - 0.90, p < 0.001).

Conclusion: There was an association between lower mortality rates in HFpEF patients with AF treated with AA. This may be due to an improvement in the atrial myopathy that complicates both AF and HFpEF as AA have been shown to reduce atrial fibrosis, dilation, and AF severity.

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EFFECT OF ANGIOTENSIN RECEPTOR NEPRILYSIN INHIBITOR AND EMPAGLIFLOZINE ON ISCHEMIC VENTRICULAR TACHYCARDIA SUBSTRATE: A HIGH-DENSITY MAPPING AND MRI STUDY

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Background: Angiotensin receptor neprilysin inhibitor (ARNI) and empagliflozine reduce cardiovascular death in heart failure, but mechanistic data on this effect are scarce.

Objective: To assess the effect of ARNI and empagliflozine on scar remodeling and ventricular tachycardia (VT) inducibility in a swine model of chronic myocardial infarction (MI).

Methods: Left anterior descending artery MI was induced in 40 Landrace Large X White pigs. Thirty-one animals (78%) survived the MI induction procedure and were randomized to receive treatment with beta-blocker (BB) only (group 1, n=7), empagliflozine+BB (group 2, n=8), ARNI + BB (group 3, n=8) or empagliflozine + ARNI + BB (group 4, n=8). Contrast-enhanced (ce)-MRI were performed at 2-day (baseline) and 1-month post-MI and were post-processed with ADAS 3D; ventricular scar subtypes and borderzone (BZ) corridors volume were measured. EP study with endo-epicardial high-density mapping was performed 1-month post-MI.

Results: VT was inducible in 21/31 subjects (68%). Treatment with ARNI (groups 3 and 4) showed a significant reduction of VT inducibility (OR 0.15 [0.026-0.91], p=0.03) compared to non-ARNI groups (100%, 75%, 50% and 50% for groups 1, 2, 3 and 4, respectively), representing a 30% relative risk reduction. Treatment with empagliflozine (group 2) did not reduce VT inducibility (p=0.704). Baseline ceMRI data showed a mean core and BZ scar mass of 5.4 ± 3.1 and 6.1 ± 3.1 grams, respectively, without significant differences in the percentage of core scar. The mean number of corridors was 2.1 ± 1.2 with a mean mass of 1.3 ± 1.0, without significant differences across groups. Treatment with ARNI and empagliflozine significantly reduced the number (+1.0, -1.1, -1.2 and -1.7 corridors for groups 1, 2, 3 and 4, respectively; p=0.021) and mass of corridors (+0.3, -1.6, -0.8 and -0.4 grams for groups 1, 2, 3 and 4, respectively; p=0.012) at the follow-up ceMRI. ARNI and empagliflozine groups tended to reduce overall BZ mass compared to the control group (reduction of the BZ percentage: -1.2 ± 4, -4.9 ± 2, -5.6 ± 2, -3.8 ± 4; p=0.102).

Conclusion: Treatment with ARNI reduced VT inducibility by 30% after MI, likely driven by a significant reduction of the number and mass of BZ corridors. Empagliflozine reduced the number and mass of BZ corridors, without impact on VT inducibility.

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LEFT BUNDLE-BRANCH PACING POST-ATRIOVENTRICULAR JUNCTION ABLATION FOR ATRIAL FIBRILLATION: PROPENSITY-SCORE MATCHING WITH HIS BUNDLE PACING

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Background: Left bundle branch pacing (LBBP) has emerged as a promising pacing modality to preserve physiological left ventricular activation but has limited prospective data evaluating