analysis was assigned at p<0.05. **Results:** We had a total population of 18018 patients with underlying diagnosis of End-Stage HF, they were divided into two groups. Patients who received PC services versus who did not. There was higher odd of PC encounter in older patients (OR, 1.018 [CI 1.015- 1.021] p <0.05), cardiogenic shock (OR, 1.915 [CI 1.724-2.126] p <0.05). There was low likely hood of PC encounter in female gender (OR, 0.793 [CI 0.739-0.851] p <0.05), mechanical circulatory support (MCS) (OR, 0.827 [0.687-0.996] p<0.05) or pacemaker placement (OR, 0.738 [0.426-1.280] P 0.280) (Figure 1). Inpatient mortality was significantly higher in patients with PC encounter, with shorter length of stay and lower cost of hospitalization (Table 1). **Conclusion:** Fairly high number of patients, 24.76% with End-Stage HF received palliative care encounter during the study period. There are gender and racial discrepancies that exist in utilization of these services.

Table 1: Analysis of End Stage CHF hospitalizations and use of Palliative care services between the years of 2017-2020: Insights from National Inpatient Sample (NIS) database.

Variables	End Stage HF without Palliative Care *(n =13555)*	End Stage HF with Palliative Care *(n = 4463)*	P-value
Mean Age in years	65 ± 16	74 ± 14	<0.05
Gender			<0.05
• Female	4451 (32.8%)	1702 (38.1%)	
Race			<0.05
• White	7598 (57.6%)	2928 (67.3%)	
• *Black*	3707 (28.1%)	913 (21.0%)	
• Hispanic	1173 (8.9%)	345 (7.9%)	
• Asian	309 (2.3%)	80 (1.8%)	
DNR Status	2233 (16.5%)	3189 (71.5%)	<0.05
Comorbidities			
Peripheral Vascular Disease	1371 (10.1%)	525 (11.8%)	<0.05
Diabetes	6181 (45.6%)	1772 (39.7%)	<0.05
Atrial Fibrillation	4349 (32.1%)	1539 (34.5%)	<0.05
Obesity	2657 (19.6%)	486 (10.9%)	<0.05
CKD	3334 (24.6%)	1309 (29.3%)	<0.05
Complications			
Cardiogenic Shock	2676 (19.7%))	1154 (25.9%)	<0.05
Ventricular Tachycardia	2962 (21.9%)	797 (17.9%)	<0.05
Acute Kidney Injury	6199 (45.7%)	2500 (56.0%)	<0.05
Procedures Performed			
Transfusion	919 (6.8%)	227 (5.1%)	<0.05
AICD placement	255 (1.9%)	25 (0.6)	<0.05
Pacemaker Placement	108 (0.8%)	20 (0.4%)	<0.05
Mechanical Circulatory Devices	1167 (8.6%)	207 (4.6%)	<0.05
Intubation	727 (5.4%)	309 (6.9%)	<0.05
Vasopressor Support	982 (7.2%)	390 (8.7%)	<0.05
Outcomes			
Inpatient Death	904 (6.7%)	1310 (29.4%)	<0.05
Length of Stay (Mean days)	11 ± 15	9 ± 12	<0.05
Total Charges ($)	184,338	113,061	<0.05

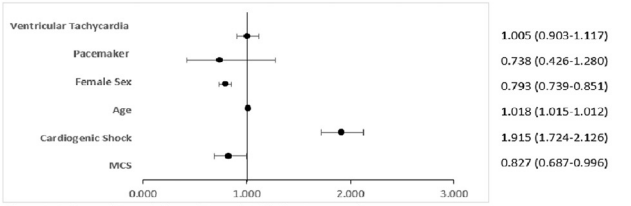

Figure 1: Adjusted Association of Use of Palliative Care service.

244

Left Ventricular Assist Device Implantation Outcomes In Patients With Subcutaneous Implantable Cardioverter-defibrillators: A Case Series

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Introduction: Patients undergoing left ventricular assist device (LVAD) implantation for advanced heart failure may have a previously implanted implantable cardioverter-defibrillator (ICD) for primary or secondary prevention of sudden cardiac death. Electromagnetic interference (EMI) has been reported following LVAD implantation in patients with traditional transvenous ICDs, leading to inappropriate device shocks. Recently, subcutaneous ICDs (SICDs) have gained popularity due to their lower risk of infectious-related complications and preservation of vascular access. Little is known about the impacts of LVAD implantation on patients with SICDs, and particularly about the effects of LVAD-related EMI with these devices. **Hypothesis:** Like traditional ICD systems, SICDs may be prone to EMI following LVAD implantation. As such, patients with preexisting SICDs may be at risk for inappropriate device shocks after LVAD placement. **Methods:** We retrospectively reviewed the outcomes in 6 patients at a single center with nonischemic cardiomyopathy and subcutaneous ICDs who underwent HeartMate 3 LVAD implantation between August 2022 and January 2023. Data including incidence of VT/VF, device interrogations, appropriate and inappropriate device therapies were collected. **Results:** The mean age was 46 years old, and 2 patients (33%) were female. Additionally, 2 patients (33%) had experienced VT/VF prior to ICD implantation. The mean time between SICD implantation and LVAD implantation was 70 months. Inappropriate shocks due to LVAD-related EMI were experienced by 3 patients (50%). Device therapies were disabled after inappropriate shock in these patients and additionally disabled in 2 other patients (for a total of 5/6 patients). Therapies remained activated without EMI or inappropriate shock in 1 patient. Extraction of the SICD was performed for 1 of the patients who experienced EMI-related shock and 1 patient's SICD lead was intentionally transected during LVAD implantation. Of the patients who experienced EMI-related shocks, 2 occurred within 24 hours of LVAD implantation and 1 occurred 33 days following LVAD implantation. Pre- and post-implant SICD EGMs demonstrated a loss of signal fidelity and EMI after LVAD implantation in these patients [Figure 1]. **Conclusions:** Among patients with SICDs undergoing LVAD implantation, there was a very high incidence of EMI leading to inappropriate device therapies. We suggest deactivation prior to LVAD implantation. Caution should be taken prior to reactivation of therapies to verify the absence of EMI. Permanent deactivation and/or device removal following LVAD implantation can also be considered.

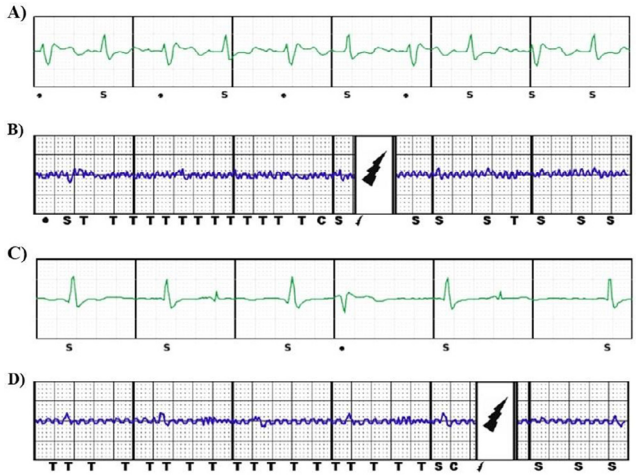

Figure 1. SICD electrograms obtained before (A, C) and after (B, D) LVAD implantation in 2 patients who experienced EMI related shock within 24 hours of LVAD implantation.

245

Fontan Associated Liver Disease (FALD) - When Should We Consider Combined Heart-lung Transplant

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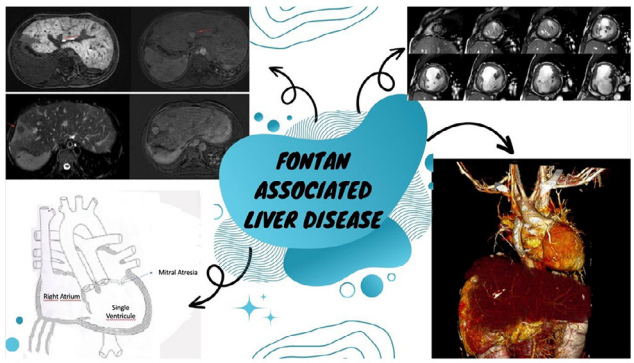
Introduction: Heart failure, plastic bronchitis, protein losing enteropathy and Fontan associated liver disease (FALD) are the most challenging long-term complications in Fontan patients, and heart transplant is usually the best treatment in these cases. Identifying the right time for heart transplant is of utmost importance, and combined heart-liver transplant should be considered in patients with FALD. **Case report:** Female, 21 year-old, with left isomerism, single right ventricle, mitral valve atresia, double right ventricle outflow tract and transposition of the great arteries. She had already had bilateral Glenn surgery (2001), Fontan operation with valve repair (2010), hepato-atrial fistula embolization (2019), and hepato-pulmonary fistula embolization (2021).Since 2020, the patient has complained about clinical deterioration, including worsening functional class (NYHA II-III), lower O2 saturation (71%), pain in the lower limbs, and abdominal pain. She has had leukopenia and thrombocytopenia and a bone marrow biopsy revealed no changes. Catheterization revealed that there was no

obstruction in the Fontan circulation, in addition to adequate pulmonary pressures, occult diastolic dysfunction and significant left lung micro fistulas. Angiotomography performed in 2022 revealed right and left superior vena cava connected by wide anastomosis to ipsilateral pulmonary arteries, a dilated hemizygos vein with a larger caliber than the aorta connected to the left superior vena cava, azygos vein of increased caliber, hepatic veins connected to an extra cardiac tube to the right pulmonary artery, several mediastinal collaterals. Liver elastography observed clinically significant portal hypertension and probable focal hepatic steatosis. Abdomen magnetic resonance demonstrated signs of chronic congestive liver disease with fibrosis and liver nodules, and pelvic varicose veins. Liver biopsy was not performed due to risk of bleeding. Alpha-fetoprotein was 4.5 mcg/L, liver function was unremarkably normal with INR slightly high (1.4). **Conclusion:** Heart function and the Fontan circuit were normal in this patient, but the systemic congestion with chronic congestive liver disease, the hypoxemia due to the micro fistulas and the poor functional class led us to consider combined hear-liver transplant. The patient is awaiting on the list.



246

Ultrasound Skeletal Muscle Thickness, Muscle Strength, And Cardiopulmonary Exercise Testing Variables In Patients With Advanced Heart Failure

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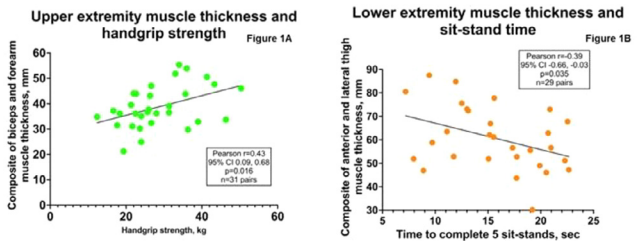
Background: Skeletal muscle ultrasound (SMUS) is an inexpensive, portable, non-ionizing method used to assess body composition in patients with heart failure with reduced ejection fraction (HFrEF). Cardiopulmonary exercise testing (CPET) is also an important clinical tool that assesses cardiovascular fitness. Preliminary data shows agreement between SMUS and dual-energy X-ray absorptiometry (DXA), but the relationship between muscle thickness by SMUS, muscle strength and cardiovascular fitness is unknown. We hypothesized that greater upper and lower extremity muscle thickness on SMUS would be associated with better performance on extremity strength testing, as well as more favorable $pkVO_2$ and VE/VCO_2 on CPET, amongst patients with HFrEF. **Methods:** Patients with HFrEF were prospectively recruited at the time of advanced therapies evaluation for muscle mass assessment and strength testing, from 2/2020 to 12/2022. A-mode BodyMetrix Pro ultrasound was used to measure skeletal muscle thickness at 4 anatomical locations (dominant side). Upper and lower extremity body strength was evaluated using a handgrip strength test and a 5 timed sit-to-stand test, respectively. Key CPET variables were retrospectively collected on this cohort. The association between upper and lower extremity muscle thickness, $pkVO_2$ (mL/kg/min), VE/VCO_2, and strength tests were assessed using Pearson correlation coefficients. **Results:** Thirty-two participants had SMUS images available. Of the cohort, 28.1% was female and the median age was 59. There was a positive correlation between upper extremity muscle thickness and handgrip strength (r=0.43, p=0.016, Fig 1A). There was a negative correlation between lower extremity muscle thickness and the sit-to-stand time (shorter time indicates greater strength; r=-0.39, p=0.035, Fig 1B). Lower extremity - but not upper extremity - muscle thickness was significantly associated with $pkVO_2$ (r=0.70, p=<0.001) and with VE/VCO_2 (r=-0.49, p=0.023). **Conclusion:** SMUS upper and lower extremity muscle thickness was significantly associated with the respective strength measures. Lower extremity muscle thickness was significantly associated with greater cardiovascular fitness, per peak VO_2 and VE/VCO_2 measures. These findings support the validity of SMUS-measured muscle thickness as an emerging technique to screen for sarcopenia in patients with advanced HFrEF.



247

The Glucose-lowering And Cardiorenal Effects Of CRRL094, A Novel Bispecific Peptide, Versus Exogenous Insulin In Experimental Diabetes

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Background: Diabetes mellitus (DM) continues to increase in prevalence, along with its deleterious cardiorenal effects. Exogenous insulin, a mainstay of DM therapy, may exacerbate adverse cardiovascular outcomes. **Objectives:** To compare the cardiorenal actions of CRRL094, a novel dual-action peptide, that induces endogenous insulin secretion and activates the natriuretic peptide system, to those of exogenous insulin. **Methods:** The study included Wistar rats (male, 6-8-week-old) that were divided them into 4 groups: 1 group remained non-diabetic controls (CTL, n=17) and 3 groups were made diabetic using Streptozotocin (65 mg/kg). The rats were diabetic for 8 weeks. Next, one group received placebo (untreated diabetic, UDM, n=17), one group received CRRL094 (10 pmol/kg/min, CDM, n=11) and another group received insulin (10 nmol/mL, IDM, n=9). After 4 weeks of treatment (12 weeks of experiment time), rat blood and tissues were harvested. **Results:** CRRL094 restored insulin levels to those similar to nondiabetic controls (mean± standard deviation [ng/mL]: CTL, UDM, CDM, IDM: 0.67±0.37, 0.04±0.03, 0.69±0.55,2.746±0.88; p <0.0001) and attenuated the DM-associated hyperglycemia (mean± standard deviation [mg/dL]: CTL, UDM, CDM, IDM: 106.9±12.9, 437.8±73.9, 361.7±51.9, 267.8± 51.3, p <0.0001). While exogenous insulin resulted in a significant decrease in plasma cGMP, which was associated with increased LV fibrosis, CRRL094 doubled cGMP as compared to UDM (Figure 1a), and that increase was associated with decreased LV fibrosis (Figure 1b). Renally, CRRL094 was associated with attenuating the DM-associated GFR decline while exogenous insulin resulted in hyperfiltration (mean± standard deviation [mL/min]: CTL, UDM, CDM, IDM: 1.86±0.52, 1.18±0.70, 1.84±0.72, 6.42±4.21, p <0.0001). Additionally, CRRL094 showed a trend towards attenuation of proteinuria (mean± standard deviation [mg/mL/min]: CTL, UDM, CDM, IDM: 0.69±0.28, 1.87±0.69, 1.40±0.51, 1.88±0.66, p < 0.0001). **Conclusions:** While both CRRL094 and exogenous insulin lowered the DM-associated hyperglycemia, only CRRL094 attenuated the DM-associated increase in LV fibrosis, proteinuria, and GFR decline. Future studies assessing its safety and efficacy are warranted.

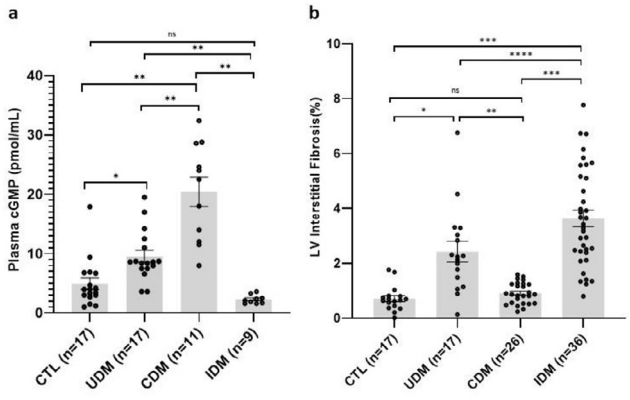

Figure 1: CRRL094, unlike insulin, significantly increased plasma cGMP (a), and attenuated the DM-associated LV fibrosis (b).