

Poster presentation

Open Access

Evaluation of patients with systemic sclerosis prior to hematopoietic stem-cell transplantation using cardiac magnetic resonance imaging

Amir H Davarpanah^{*1}, Peter Weale², John J Sheehan¹, Cormac Farrelly¹, Karin Dill¹, Sanjiv Shah¹, Richard K Burt¹ and James C Carr¹

Address: ¹Northwestern University, Chicago, IL, USA and ²Siemens Medical Solutions, Chicago, IL, USA

* Corresponding author

from 13th Annual SCMR Scientific Sessions
Phoenix, AZ, USA. 21-24 January 2010

Published: 21 January 2010

Journal of Cardiovascular Magnetic Resonance 2010, **12**(Suppl 1):P259 doi:10.1186/1532-429X-12-S1-P259

This abstract is available from: <http://jcmr-online.com/content/12/S1/P259>

© 2010 Davarpanah et al; licensee BioMed Central Ltd.

Introduction

The expanding role of hematopoietic stem-cell transplantation (HSCT) for treatment of autoimmune diseases such as systemic sclerosis (SSc) necessitates efficient cardiac pre-assessment, due to transplant-related cardiovascular complications and even mortality in high-risk patients. Pulmonary hypertension (PH) is considered a major risk factor for HSCT and current guidelines recommend using echocardiography followed by invasive right heart catheterization (RHC) for risk stratification of these patients.

Purpose

To evaluate the utility of cardiac MRI (CMR) as a tool for detection of PH and risk stratification in patients with SSc prior to HSCT.

Methods

Twenty one patients with SSc who underwent CMR as part of their pre-HSCT cardiovascular evaluation and 10 controls were evaluated. Post/pre-HSCT brain natriuretic peptide (BNP) ratio as the indicator of ventricular strain was calculated in 16 patients. All patients had RHC within 2 weeks MR study and were divided into 3 groups based on their Mean Pulmonary Arterial Pressure (mPAP): Mild-PH, mPAP > 25; Borderline-PH, mPAP = 20 - 25; No-PH, mPAP < 20. Right ventricle (RV) volumetric & pulmonary artery (PA) flow analysis was carried out and following parameters were calculated: time to peak systole (TPS),

ejection fraction (EF), full width at half maximum (FWHM), downslope (DS), upslope (US), time to peak velocity in systole (TPVS) and diastole (TPVD), Acceleration and Ejection time (AT & ET). These values were compared among groups and then correlated with mPAP values in all patients.

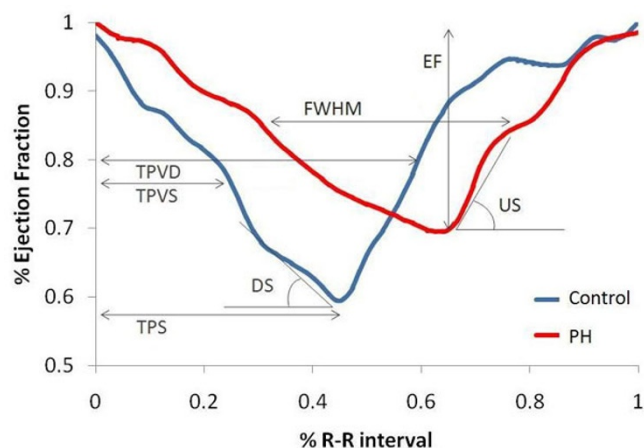


Figure 1

Results

There were 3 deaths in the patient group (2 mild-PH, 1 borderline-PH). Mild & borderline-PH groups had higher values of TPS, FWHM/EF ratio, TPVS, TPVD, AT, ET, BNP ratio and lower values of DS and US when compared to controls and RV volume curves showed displacement towards end of cardiac cycle and systolic prolongation. These differences were more pronounced in patients who died. No significant difference was found between mild and borderline PH groups and also between no-PH and control groups. Values of TPS which correspond to duration of systole demonstrated strong correlation with mPAP ($r = 0.71$) and moderate correlation with PVR ($r = 0.58$), Figure 1.

Conclusion

RV volumetric parameters as measured by CMR are useful for differentiating patients in various stages of PH. The displacement of RV systolic curve towards end cardiac cycle which correlated with higher values of BNP ratio may predict post-transplant RV dysfunction and worse outcomes in PH patients and can be used to noninvasively detect PH.

Publish with **BioMed Central** and every scientist can read your work free of charge

"BioMed Central will be the most significant development for disseminating the results of biomedical research in our lifetime."

Sir Paul Nurse, Cancer Research UK

Your research papers will be:

- available free of charge to the entire biomedical community
- peer reviewed and published immediately upon acceptance
- cited in PubMed and archived on PubMed Central
- yours — you keep the copyright

Submit your manuscript here:
http://www.biomedcentral.com/info/publishing_adv.asp

