Journal of Cardiovascular Magnetic Resonance

Oral presentation

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Dilated cardiomyopathy risk stratification; the vital role of CMR

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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):O49 doi:10.1186/1532-429X-12-S1-O49

This abstract is available from: http://jcmr-online.com/content/12/S1/O49

Background

Risk stratification in dilated cardiomyopathy (CMX) pts with advanced heart failure remains a clinical challenge. A simple manner to non-invasively risk stratify this cohort would have obvious advantages.

Hypothesis

Utilizing cardiovascular MRI (CMR), recently demonstrated to identify abnormal myocardial substrate via the delayed hyperenhancement technique (DHE), we hypothesize that +DHE with a mid-wall stripe will represent an adverse prognosis as defined by need for urgent cardiac transplantation (TX), LVAD or death.

Methods

Over 24 consecutive months, 49 CMX pts were referred for standard 3D CMR (1.5 T GE) to interrogate the LV pattern, distribution and extent of DHE (MultiHance, Princeton, NJ). 18 pts met follow-up inclusion criteria for the study. Pts were categorized into: 1)+DHE/+midwall Stripe 2)+DHE/-Stripe and 3)-DHE/-Stripe. LVAD, Tx use, major adverse clinical events (MACE) and event free survival were evaluated over the next 6 months.

Results

All pts were alive at 6 months while 6 required Tx. All pts completed the CMR exam in 50 ± 10 minutes. 13/18 (72%) were +DHE, 10/13(77%) had +stripe and 5/18 (28%) pts were -DHE/-stripe. There were no difference between groups for initial LVEF, LVEDD, NYHA, or CO/CI as measured by hemodynamics at time of hospital admission. DHE+/Stripe+ categorization strongly predicted the need for LVAD and/or urgent Tx surgery over the ensuing 6 months ($X^2 = 7$, $p < 0.05$). Specifically, 6/10 (60%) +DHE/+Stripe pts required urgent Tx by 6 months while no +DHE/- Stripe or -DHE/-Stripe pts experienced the need for LVAD *or* urgent Tx. Similarly, a +DHE/+Stripe strongly predicted MACE (X^212, $p < 0.005$). No -DHE/-Stripe or +DHE/-Stripe pt had MACE.

Conclusion

CMX pts with advanced CHF require an improved risk stratification policy. Using standard CMR, the presence of +DHE/+Stripe is remarkably predictive of LVAD and Tx need over the ensuing 6 months. No other clinical metric by multivariate analysis predicted Tx need. Also +DHE/+stripe strongly predicted MACE. Further, those +DHE/-Stripe and -DHE/-Stripe pts had a far better prognosis; there were neither need for LVAD/Tx nor any MACE. Incorporating this approach into routine clinical practice may help conservatively manage low risk pts while expectantly manage high-risk.