

Poster presentation

Open Access

Qualitative agreement of aortic regurgitation assessed by steady state free precession signal void as compared to doppler echocardiography

Mark R Bowers*, Raymond Q Migrino, Daniel Eastwood and Jason C Rubenstein

Address: Medical College of Wisconsin, Cardiovascular Medicine, Milwaukee, WI, 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):P289 doi:10.1186/1532-429X-12-S1-P289

This abstract is available from: <http://jcmr-online.com/content/12/S1/P289>

© 2010 Bowers et al; licensee BioMed Central Ltd.

Introduction

Previous studies demonstrated correlation in assessment of severity of AR between spoiled gradient-echo CMR and phase contrast color Doppler echocardiography in AR patients as well as normal subjects (Pflugfelder, et al. *Am J Roentgenol* 1989; 152:729-35). SSFP gradient-echo sequence is now a mainstay in evaluating cardiac function, as well as valvular structures. Aortic regurgitation creates flow disturbances that manifests as signal void from signal dephasing. This study compares the qualitative assessment of AR using SSFP CMR versus Doppler echocardiography.

Purpose

To compare aortic regurgitation (AR) assessed by CMR (signal loss/dephasing flow disturbances by steady-state free precession, SSFP, gradient-echo sequence) versus Doppler echocardiography.

Methods

Between 1/2004-7/2009, 256 CMRs were performed at our institution for multiple clinical indications. A review of the interpretations of all CMRs identified 24 subjects with some degree of AR identified by CMR and a Doppler echocardiogram performed within 6 months of the CMR. An additional 24 randomly selected subjects with CMRs who did not have AR by the initial CMR report and a Doppler echocardiogram within 6 months of the CMR were evaluated. From this pool of 48 subjects (55 ± 16 years, 28 females), two investigators with Level III training in CMR

performed blinded and independent qualitative reassessment of AR severity from SSFP (FOV 25-40 cm, TR 3-42 msec, TE 1.3-1.5 msec) using the following scoring system: none, mild, moderate and severe. If there was a discrepancy in scoring, a consensus score was agreed upon and used for final analysis. The score was compared to AR severity assessed using Doppler echocardiography by experts in echocardiography using the same scoring system. Kappa statistic was used to determine agreement between CMR and Doppler echocardiography as well as by interobserver scoring of CMR severity.

Results

CMR- and echocardiography-assessed AR severity are shown in Table 1. Weighted kappa between CMR versus Doppler echocardiography was 0.59 (95% CI 0.34-0.84, $p < 0.001$) signifying moderate-good agreement. Weighted kappa for CMR-AR severity between observer 1 versus observer 2 was 0.83 (95% CI 0.71-0.96, $p < 0.001$) signifying strong interobserver agreement.

Conclusion

There was a significant agreement between qualitative measurement of aortic regurgitation severity by SSFP CMR signal void and Doppler echocardiography, the current noninvasive gold standard. In addition, CMR assessment is associated with strong interobserver agreement. Aortic regurgitation severity can be reliably and rapidly assessed by SSFP CMR which adds to the diagnostic and cost-effectiveness of routine CMR sequences.

Table 1:

		AR by CMR vs. Echocardiography			
		CMR			
		<i>none</i>	<i>mild</i>	<i>moderate</i>	<i>severe</i>
Echocardiography	<i>none</i>	19	5	1	0
	<i>mild</i>	9	5	1	0
	<i>moderate</i>	1	2	4	0
	<i>severe</i>	0	0	0	1