

Poster presentation

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Does DHE imaging insight into the inaccuracy of EKG's?

Wadih Nadour* and Robert W Biederman

Address: The Center for Cardiovascular Magnetic Resonance Imaging, The Gerald McGinnis Cardiovascular Institute at Allegheny General Hospital, Pittsburgh, PA, 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):P60 doi:10.1186/1532-429X-12-S1-P60

This abstract is available from: <http://jcmr-online.com/content/12/S1/P60>

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Background

The presence of Q wave on EKG remains in wide clinical use to identify people with prior myocardial infarct (MI). We hypothesized that standard assessment of infarct presence relying on EKG is both insensitive and inaccurate especially as compared to CMR DHE assessment regardless of the DHE pattern (ischemic versus non-ischemic).

Objectives

The purpose of the study is to relate EKG defined scar (Q waves) as compared to late gadolinium enhancement (DHE) cardiovascular magnetic resonance (CMR) defined scar independent of the underlying pathology.

Methods

We reviewed a total of 106 unselected, consecutive patients who underwent CMR with DHE and had an EKG performed within 1 day of CMR. EKGs were screened for the presence of a Q wave and compared to those with a positive DHE regardless of the myocardial post-gadolinium pattern. Then we divided the patients into 3 subgroups: 1) one group with only positive DHE (DHE+) pattern of ischemia 2) the other group with other DHE (DHE+/-) patterns or 3) negative DHE (DHE-). Furthermore, we divided the ischemic group (DHE+) into transmural vs. endocardial.

Results

While 58/106 (45%) patients were either DHE+ or DHE+/-, Q waves were present in only 24/106 patients (22%). However, of the DHE+ or DHE+/- patients, only 22 (20%) had an ischemic DHE pattern representing little overlap

between presence of DHE+ and finding of Q waves on EKG. The sensitivity and specificity of EKG to detect infarct were 63% and 90%, respectively. In the subgroup of patients divided into transmural infarcts (15) and endocardial infarcts (7) the sensitivity was 60% and 57%, respectively. However, of 10/24 (41%) patients with Q waves on EKG, 50% were either DHE- (5/10) or DHE+/- (5/10).

Conclusion

EKG remains the most widely used method in clinical practice to identify patients with prior infarcts based on the presence of Q waves, yet it has a low sensitivity compared to CMR DHE defined scar. This sensitivity does not appreciably change with the presence of transmural versus subendocardial infarcts indicating Q waves are *not* synonymous with transmural. Importantly, a significant number of Q waves have no ischemic etiology indicating a high percentage of false positive results by EKG. More appropriate use of the venerable EKG is *still* necessary in 2009.