

Right ventricular echocardiographic parameters for prediction of proximal right coronary artery lesion in patients with inferior wall myocardial infarction



Maha H. El Sebaie^{a,b,*}, Osama El Khateeb^b

^a Zagazig University, Zagazig

^b King Abdulla Medical City, Makkah

^a Egypt

^b Saudi Arabia

Background: Classifying the location of an occlusion in the culprit artery during ST-elevation myocardial infarction is important for risk stratification to optimize treatment.

Objectives: To compare the validity of echocardiographic parameters assessing right ventricular (RV) function for the prediction of proximal right coronary artery (RCA) lesion in patients with inferior wall myocardial infarction.

Methods: The study included 76 patients after their first episode of acute inferior myocardial infarction with significant RCA lesion (43 patients with proximal RCA stenosis and 33 patients with distal RCA stenosis). Full echocardiographic examination was done before revascularization, including RV dimension, tricuspid annular plane systolic excursion, and tissue Doppler imaging of RV free wall at the level of the tricuspid annulus and recording the following variables: peak systolic velocity (Sm), peak early diastolic velocity, peak late diastolic velocity, ejection time (ET), isovolumetric relaxation time (IVRT), isovolumetric contraction time (IVCT), and myocardial performance index (MPI), which was calculated as $(MPI = IVRT + IVCT/ET)$.

Results: Patients with proximal RCA showed significantly lower Sm (10.44 ± 2.61 cm/s vs. 12.11 ± 2.94 cm/s, $p = 0.013$) and shorter ET (224.18 ± 49.96 ms vs. 280.90 ± 46.12 ms, $p = 0.001$). While IVRT, IVCT, and MPI were significantly higher (95.25 ± 19.22 ms vs. 68.48 ± 12.77 ms, $p = 0.001$; 81.62 ± 23.59 ms vs. 60.90 ± 17.38 ms, $p = 0.001$; and 0.82 ± 0.222 vs. 0.47 ± 0.10 , $p = 0.001$, respectively) when compared with patients with distal RCA stenosis. Multiple regression analysis including (tricuspid annular plane systolic excursion, Sm, and MPI) showed that the most independent predictors for proximal RCA lesions were MPI ($p = 0.0001$). The receiver operator characteristic curve for MPI showed areas under the curve of 97% and a confidence interval of 93%. A cut-off value of 0.58 for MPI had a sensitivity of 95% and specificity of 97% for the diagnosis proximal RCA.

Conclusions: The most independent predictors for proximal RCA lesion is MPI.

© 2015 The Authors. Production and hosting by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Keywords: Echocardiography, Right coronary artery

Disclosure: Authors have nothing to disclose with regard to commercial support.

Received 11 July 2015; revised 25 September 2015; accepted 25 October 2015.

Available online 4 November 2015

* Corresponding author at: King Abdulla Medical City, Cardiology Department, P.O. 57657, Makkah 21599, Saudi Arabia. Tel.: +966 549545143.

E-mail address: dr.mahahamed@yahoo.com (M.H. El Sebaie).



P.O. Box 2925 Riyadh – 11461KSA
Tel: +966 1 2520088 ext 40151
Fax: +966 1 2520718
Email: sha@sha.org.sa
URL: www.sha.org.sa



1016–7315 © 2015 The Authors. Production and hosting by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer review under responsibility of King Saud University.

URL: www.ksu.edu.sa

<http://dx.doi.org/10.1016/j.jsha.2015.10.002>



Production and hosting by Elsevier

Introduction

In patients with acute inferior wall myocardial infarction (IWMI), the infarct related artery could be the right coronary artery (RCA) or left circumflex artery [1].

Acute occlusion of the RCA proximal to the right ventricular branches may result in right ventricle infarction (RVI) [2–6]. This identifies a significant subgroup of patients that are associated with considerable immediate morbidity and mortality [7–11].

The diagnosis of acute ST-elevation IWMI depends mainly on specific electrocardiographic (ECG) criteria. Predicting the culprit artery in IWMI has been proposed using multiple ECG algorithms, with adequate sensitivity only in patients with extensive ST-segment deviation [12,13].

There are only limited studies validating the usefulness of various echocardiographic parameters of RV function in predicting proximal RCA stenosis. Most of them assessed only a single parameter of RV function and many lacked angiographic correlation [14]. Moreover, there are no available data comparing these parameters in predicting proximal RCA stenosis.

Objectives

To compare the validity of different echocardiographic parameters assessing RV function for prediction of proximal RCA stenosis in patients with inferior wall MI.

Patients

We screened 88 patients who were referred to King Abdulla Medical City with acute IWMI for coronary angiography and possible percutaneous coronary intervention during the period from October 2012 to February 2014. According to our inclusion criteria we enrolled 76 nonconsecutive patients (57 men and 19 women with a mean age of 58.84 ± 12.78 years) Inclusion criteria:

1. Significant RCA lesion at coronary angiography.
2. Good echocardiographic window.

Exclusion criteria:

1. Patients who were candidates for primary percutaneous coronary intervention or patients with hemodynamic instability.
2. Patients with significant left anterior descending, left circumflex artery lesion, diffuse RCA lesion, or multi-vessels disease.

Abbreviations

TAPS	Etricuspid annular plane systolic excursion
TDI	Itissue Doppler imaging
Sm	peak systolic velocity
Em	peak early diastolic velocity
Am	peak late diastolic velocity
ET	ejection time
IVRT	isovolumetric relaxation time
IVCT	isovolumetric contraction time
MPI	myocardial performance index
IWMI	inferior wall myocardial infarction
LAD	left anterior descending
LCX	left circumflex artery
RCA	right coronary artery
PCI	percutaneous coronary intervention
RVF	right ventricular failure
RVSP	right ventricular systolic pressure
RVD	right ventricular dimension
ROC	receiver operator characteristic curve
CMR	cardiac magnetic resonance

3. Poor echo window.

4. Patients with previous MI, cor-pulmonale, atrial fibrillation, or significant valvular lesion.

According to angiographic findings, the patients divided into Group A included 43 patients with proximal RCA stenosis (34 men and 9 women with a mean age of 56.88 ± 12.4 years) and Group B included 33 patients with distal RCA stenosis (23 men and 10 women with a mean age of 61.39 ± 12.8 years).

All patients gave informed consent, and ethical approval was obtained from the Internal Review Board at our institution.

Methods

Clinical evaluation

For detection of right ventricular failure (RVF) defined as hypotension and elevated jugular venous pulse in the presence of clear lung fields [15].

ECG

Twelve-lead ECG including V3R and V4R were used for diagnosis of IWMI, arrhythmias (bradycardia, high-degree atrioventricular block, atrial fibrillation, and ventricular tachycardia), and right ventricular infarction which defined as ST-segment elevation of more than 0.1 mV in V3R and V4R in ECG taken within 6 hours of onset of symptoms [16].

Laboratory tests

Blood samples were taken for measurement of cardiac biomarkers (troponin I), lipid profile (total

Download English Version:

<https://daneshyari.com/en/article/2977887>

Download Persian Version:

<https://daneshyari.com/article/2977887>

[Daneshyari.com](https://daneshyari.com)