



OPEN ACCESS

Lessons from the trials

RENASICA II: A Mexican acute myocardial infarction registry that highlights the importance of regional registries

Jassim Al Suwaidi*

ABSTRACT

Cardiovascular diseases are the leading cause of death, worldwide, with disproportionate representation in low- and middle-income countries (LMICs). The Registro Nacional de los Síndromes Coronarios Agudos II (RENASICA II) investigators reported smoking, hypertension and diabetes were the main risk factors among Mexican patients presenting with ST-elevation myocardial infarction (STEMI). Fibrinolytic therapy was administered to 37%. Primary percutaneous coronary intervention (PPCI) was performed in only 15% of patients. 30-day mortality was 10%. This study highlights the importance of conducting regional registries for quality improvement.

Keywords: myocardial infarction, registries, risk factors

Qatar Cardiovascular Research Center
and Adult Cardiology, Heart Hospital,
Hamad Medical Corporation,
Doha, Qatar

*Email: Jhao1@hmc.org.qa;
jalsuwaidi@hotmail.com

[http://dx.doi.org/
10.5339/gcsp.2014.36](http://dx.doi.org/10.5339/gcsp.2014.36)

Submitted: 1 August 2014
Accepted: 11 September 2014
© 2014 Al Suwaidi, licensee
Bloomsbury Qatar Foundation
Journals. This is an open access
article distributed under the terms
of the Creative Commons
Attribution license CC BY 4.0, which
permits unrestricted use,
distribution and reproduction in any
medium, provided the original work
is properly cited.

INTRODUCTION

Acute coronary syndrome (ACS) represents one of the most common causes of death worldwide. Several practice guidelines have been developed in Europe and North America to improve outcome of ACS patients through implementation of the recommendations into clinical practice. It is well known that there is wide gap between guidelines and implementation in real practice as was demonstrated in registry findings mainly conducted in the developed world.¹

THE STUDY

A prospective observational acute coronary syndrome (RENASICA II) registry conducted by the Mexican Cardiology Society from December 2002 to November 2003. The main objective was to provide insights into risk factors and clinical characteristics, use of diagnostic resources, risk stratification, acute treatments, and hospital outcomes in patients hospitalized with ACS. Patients were enrolled at 60 hospitals (48% public health system hospitals, 39% private hospitals, and 12% teaching hospitals from other health systems). Almost half (48%) of the hospitals were enrolled in Mexico City. Tertiary-care hospitals (35%) with access to coronary angiography, percutaneous coronary angioplasty and coronary artery bypass grafting (CABG) enrolled 90% of the patients.²

Patients with characteristics of STEMI on electrocardiogram (ECG) and who presented within 24 hours from symptoms' onset were eligible for enrollment. The diagnosis of STEMI was confirmed by the presence of biomarkers of myocardial necrosis and characteristic evolving changes on the ECG. In-hospital outcome was analyzed through major adverse cardiac events, including death, recurrent ischemia, acute MI, re-infarction, shock and stroke. These events were assessed through 30 days after ACS onset.

RESULTS

patients with suspected ACS were enrolled in the registry. 502 patients were excluded due to unspecified chest pain. Of the remaining 8098 patients, 4555 (56.3%) were diagnosed with STEMI and were the subject of the current analysis. The most prevalent risk factors were smoking (66%), hypertension (HTN) (50%), diabetes mellitus (DM) (43%), and hypercholesterolemia (26%). A history of previous MI was present in 23%. On admission 85% of patients had typical chest pain and 74% of patients presented with Killip class I. Anterior MI occurred in 56% of patients and postero-inferior MI in 40% of patients. 88% of patients received aspirin during acute hospitalization, 64% angiotensin-converting enzyme inhibitors and 51% β -blockers. Only 37% of patients received fibrinolytic therapy, where Streptokinase was the most frequent fibrinolytic regimen used and 15% had primary PCI performed. In the acute setting 34% did not receive any reperfusion therapy. Transthoracic echocardiograms were performed in 47% of patients.

The median hospital length-of-stay (LOS) was 8.1 days. The 30-day mortality rate was 10%. Major adverse cardiac conditions were as follows; recurrent ischemic in 12%, re-infarction in 4%, cardiogenic shock in 4%, and stroke in 1%. Multivariate predictors of 30-day death were; age \geq 65 yrs., Killip class IV, high-grade AV block, inferior ST elevation, left bundle branch block (LBBB), cardiogenic shock, stroke and re-infarction.

DISCUSSION

The RENASICA II was the largest ACS registry in Latin America and provided important insights into risk factors, management and outcome in that part of the world. The investigators compared their findings with previously published registries, most importantly registries from high-income countries, such as the Global Registry of Acute Cardiac Events (GRACE), the National Registry of Myocardial Infarction (NRFMI), and the Euro Heart Survey (EHS) 1 and 2.

DM and smoking were overrepresented in Mexican patients whereas high total cholesterol and triglycerides had a lower frequency when compared with high-income populations. The proportion of STEMI cases among ACS patients, the frequencies of hypertension, male sex and 30-day death rates were comparable with those registries.²

Lytic therapy was the most frequently reperfusion therapy and the vast majority of patients (82%) were treated with streptokinase because of its wider availability and lower cost than other fibrinolytic agents. Ischemic time delay in RENASICA II was attributed to the limitations and barriers that exist in LIMCs for a timely first medical contact and decreasing the door-to-reperfusion period and was similar

Table 1. Review of published randomized bariatric surgery trials.

Registry	Region/year	Age (yrs)	Men (%)	Smoking (%)	STEMI (%)	DM (%)	HTN (%)	DLP (%)	Lytics (%)	PPCI (%)	30-day mortality	30-day STEMI mortality (%)
RENASICA II (n = 8600) ²	Mexico, (2002–2003)	62	77	66	53	43	50	26	37	15		10
Gulf RACE (n = 6407) ³	Gulf, Middle east (2007)	56	76	38	39	40		32	82	8	3.6*	
Gulf RACE II (n = 7930) ⁴	Gulf, Middle east (2008–2009)	56	78.8	35.7	45.6	39.5	47.2	32.7	65.7	22.3	7.2	

RENASICA = Registro Nacional de los Síndromes Coronarios Agudos II, RACE = Registry of Acute Cardiac Events, * = in-hospital mortality rate, STEMI = ST-elevation myocardial infarction, DM = diabetes mellitus, HTN = hypertension, DLP = dyslipidemia, PPCI = primary percutaneous coronary intervention.

to that reported in the CREATE (treatment and outcomes of acute coronary syndromes in India) and ACCESS registries. The investigators reported several limitations of their study including; relatively old registry (2002–2003) and most patients were recruited in hospitals with coronary care units from the Mexico City.

We compared the findings of RENASICA II to that of registries recently conducted in the Middle East; Gulf RACE (Registry of Acute Cardiac Events)³ and Gulf RACE II⁴ (see Table 1). There are similarities in regards to gender distribution and prevalence of DM. It is noteworthy that the prevalence of DM among ACS in both regions (40%) is probably the highest when compared to other ethnicities (22–35%). We also reported high prevalence of metabolic syndrome (46%),⁵ data on metabolic syndrome was lacking in RENASICA II. Mexican ACS patients were older and had higher prevalence of HTN, smoking when compared to their Middle-Eastern counterparts. Furthermore, Mexicans were more likely to present STEMI, while PPCI percentage use was very low in both regions when compared to reports from registries conducted in Europe and North America. Findings from Gulf RACE and Gulf RACE-2 resulted in changing practice for STEMI patients in Qatar. Countrywide primary PPCI (24 hours service) in Qatar,⁶ which was launched in October 2013 and so far it is the main modality of reperfusion therapy (> 99% of STEMI patients), further highlighting the importance of conducting regional registries for quality improvement.

WHAT WE HAVE LEARNED?

RENASICA II highlights the importance of conducting registries in various geographic locations and among different ethnicities. These registries represent a link between randomized clinical trials, guidelines, and real clinical practice in the various communities and may help decision makers for quality improvement in the care of STEMI patients.

REFERENCES

- [1] Al Suwaidi J. Acute coronary syndrome in the Middle East: The importance of registries for quality assessment and plans for improvement. *Glob Cardiol Sci Pract.* 2013 Nov 1;2013(1):2–4.
- [2] Juárez-Herrera Ú, Jerjes-Sánchez C, and the RENASICA II Investigators. Risk factors, therapeutic approaches, and in-hospital outcomes in Mexicans with ST-elevation acute myocardial infarction: The RENASICA II Multicenter Registry. *Clin Cardiol.* 2013;36(5):241–248.
- [3] Zubaid M, Rashed WA, Almahmeed W, Al-Lawati J, Sulaiman K, Al-Motarreb A, Amin H, Al Suwaidi J, Alhabib K. Management and outcomes of Middle Eastern patients admitted with acute coronary syndromes in the Gulf Registry of Acute Coronary Events (Gulf RACE). *Acta Cardiol.* 2009 Aug;64(4):439–446.
- [4] Alhabib KF, Sulaiman K, Al-Motarreb A, Almahmeed W, Asaad N, Amin H, Hersi A, Al-Saif S, AlNemer K, Al-Lawati J, Al-Sagheer NQ, AlBustani N, Al Suwaidi J, Gulf RACE-2 investigators. Baseline characteristics, management practices, and long-term outcomes of Middle Eastern patients in the Second Gulf Registry of Acute Coronary Events (Gulf RACE-2). *Ann Saudi Med.* 2012 Jan-Feb;32(1):9–18.
- [5] Al Suwaidi J, Zubaid M, El-Menyar AA, Singh R, Rashed W, Ridha M, Shehab A, Al-Lawati J, Amin H, Al-Mottareb A. Prevalence of the metabolic syndrome in patients with acute coronary syndrome in six middle eastern countries. *J Clin Hypertens (Greenwich).* 2010 Nov;12(11):890–899.
- [6] Gehani A, Al Suwaidi J, Arafat S, Tamimi O, Alqahtani A, Al-Nabti A, Arabi A, Aboughazala T, Bonow RO, Yacoub M. Primary coronary angioplasty for ST-Elevation Myocardial Infarction in Qatar: First nationwide program. *Glob Cardiol Sci Pract.* 2013 Nov 1;2012(2):43–55.