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Review article

# Acute coronary syndrome in the Middle East: The importance of registries for quality assessment and plans for improvement

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## ABSTRACT

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. Here in we review main gaps in the management of ACS patients observed from two recent registries conducted in the Middle East.

*Keywords:* acute coronary syndrome, ST-elevation myocardial infarction, Non-ST-elevation acute coronary syndrome, thrombolytic therapy, primary percutaneous coronary intervention

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## ACS IN THE MIDDLE EAST

Heart disease is the major cause of death worldwide. Many individuals with heart disease present with acute coronary syndrome (ACS); this puts them at significant risk of morbidity and mortality. This significant burden necessitates ongoing improvements in patient management to minimize these complications. These improvements in outcome are promoted by an evidence-based approach shaped by comprehensive clinical guidelines.

The Gulf Heart Association (GHA) has launched two multicenter multinational registries of ACS: The Gulf Registry of Acute Coronary Events (Gulf RACE),<sup>1</sup> which was conducted in 2007 and included 8,169 patients with ACS from six adjacent Middle eastern countries (Bahrain, Kuwait, Qatar, Oman, the United Arab Emirates, and Yemen), and the Gulf-RACE-2, which was conducted in 2009 and included 7,939 patients with ACS from Middle eastern countries (Bahrain, Saudi Arabia, Qatar, Oman, United Arab Emirates and Yemen) with one-year follow-up.<sup>2</sup> These two registries provided valuable information to health care officials. Whereas some aspects of the care provided were comparable to that of the developed countries, other aspects were clearly suboptimal. These main suboptimal practices are summarized in this commentary.

One of the most striking findings was the under-utilization of emergency medical services (EMS). Only 17% of patients in Gulf RACE were presented to the emergency department by EMS,<sup>3</sup> with the remaining patients arriving by private cars. When compared to reports in the developed world this is extremely low rate. Canto et al.<sup>4</sup> reported 53.4% use of EMS in the 2<sup>nd</sup> National Registry of Myocardial Infarction, which was conducted between June 1994 and March 1998 in the United States; this rate increased only to 60% a decade later as was documented in the National Cardiovascular Data Registry Acute Coronary Treatment and Intervention Outcomes Network Registry–Get With the Guidelines (2007–2009).<sup>5</sup> Nevertheless it is much higher than that demonstrated in our two registries. We also observed that the frequency of EMS utilization was similarly low in patients presenting with ST-segment elevation myocardial infarction (18%) and non-ST elevation ACS (17%). Moreover, the utilization of EMS was low among patients presenting with typical chest pain (16%), pulmonary edema (32%), cardiogenic shock (30%), or cardiac arrest (29%).<sup>3</sup>

However, when patients with ST-elevation myocardial infarction (STEMI) were transported by EMS, they were significantly less likely to exhibit major delay in presentation and were significantly more likely to receive favorable processes of care, including shorter door-to-ECG time and more frequent reperfusion therapy emphasizing the importance of using EMS services.<sup>3</sup>

These findings have significant implications for improving care and outcome of ACS patients for Gulf countries and may suggest redirecting emphasis in improvement of pre-hospital care. The improvement in inpatient care is reflected in relatively low in-hospital mortality rates among patients with ACS in the region, as was documented in the 2 registries.<sup>2,3</sup>

The second issue is the reperfusion therapy used for STEMI patients in the Gulf countries. In many randomized clinical trials, primary percutaneous coronary intervention (PCI) has been shown to be superior to thrombolytic therapy (TT).<sup>6</sup> This benefit is related to a much higher early mechanical reperfusion rate in comparison to TT. Indeed, the vast majority of acute cardiac centers in North America and Europe use primary PCI as the main modality of reperfusion therapy.<sup>6</sup> In a recent analysis of 30 European countries, primary PCI was the main modality of treatment.<sup>7</sup> The striking finding in Gulf RACE registries was the use of TT as the primary reperfusion modality. Among 2,155 STEMI patients in Gulf RACE, 84% underwent thrombolytic therapy and only 8% underwent primary PCI. This low overall use was present in small as well as larger countries, and in poor as well as well rich countries.<sup>8</sup>

Thirdly, there is an overall under-utilization of cardiac catheterization for patients admitted with acute coronary syndrome. The overall rate of in-hospital cardiac catheterization for ACS patients was only 20% with some variability among the various Gulf countries,<sup>9</sup> which is considerably low when compared to previous studies. In the multinational GRACE (Global Registry of Acute Coronary Events) registry,<sup>10</sup> catheterization use was about 60%, as was the case in the CRUSADE (Can Rapid Stratification of Unstable Angina Patients Suppress Adverse Outcomes with Early Implementation of the ACC/AHA Guidelines) registry<sup>11</sup> for Non-STE-ACS. Sixty-five percent of patients with ACS in the Canadian registry underwent cardiac catheterization.<sup>12</sup>

Furthermore, we observed that low-risk patients were more likely to undergo cardiac catheterization when compared with intermediate and high-risk patients. This is consistent with many studies reported from Western countries, suggesting the urgent need to implement guidelines that risk-stratify patients more appropriately. Moreover, there is lack of cardiac catheterization facilities in significant number of

hospitals involved in the region, which undoubtedly contributes to this overall low use. These two ACS registries suggested the need for current and future expansion of cardiac catheterization laboratories in many hospitals in the Gulf. This need obviously varies among the different countries involved. Finally, there is urgent need to implement ways to target patients for catheterization who would benefit most from this procedure.

The current review suggests three major gaps in the management of ACS in the Gulf; which are underuse of EMS, primary PCI and in-hospital cardiac catheterization. In Qatar, plans are underway to launch a nationwide primary PCI program which will require educating the public of the need to use EMS, close and coordinated work between EMS personal, emergency room and cardiology staff for expedited process of ECG evaluation and transfer for cardiac catheterization laboratory at the Heart Hospital for primary PCI or early invasive therapies, with the hope of further improvement of outcome in these high risk patients.

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