Implementation of a STEMI bypass protocol in Ras al-Khaimah, United Arab Emirates

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Acute coronary syndrome (ACS) is one of the leading causes of morbidity and mortality worldwide and almost half of the mortality associated with ACS in the Middle East occurs in the pre-hospital setting.

Previous studies indicate that Middle Eastern populations utilise emergency medical services (EMS) less in ACS (17-25%), have higher rates of co-morbidity, and are younger (mean age 56 years).

The act of translating the existing evidence to a practical system implementation in the UAE had the potential to expose challenges.

The majority of existing evidence for the inclusion of prehospital ECGs and PCI activation has been produced in Western countries, with established, high-performing EMS systems, using clearly defined address systems and advanced life support clinicians.

We sought to apply this evidence to an Arab Gulf country, where the concept of EMS with the capability to provide clinical treatment and not just transport, is a relative novelty.

There is no clearly defined address system, with many callers providing landmarks and directions instead of a physical address. The EMS service was only 2.5 years in existence at the time of this study. Prehospital care is mainly delivered in the Northern Emirates through basic life support clinicians.

The aim was to evaluate the translation of a ST-segment elevation myocardial infarction (STEMI) bypass protocol to the outcomes of patients with acute coronary syndrome in the Emirate of Ras al-Khaimah in the United Arab Emirates (UAE).

A prospective cohort study was conducted, which included all patients who had a prehospital 12-lead electrocardiogram (ECG) performed. Data was collected on custom designed forms.

Analysis of all cases identified as STEMI positive and who subsequently underwent percutaneous coronary intervention (PCI) at Sheikh Khalifa Speciality Hospital (SKSH), RAK, was performed.

Emergency Medical Technicians were provided with training on the clinical protocol and study protocol including data collection forms.

Patients who subsequently underwent PCI in SKSH had an in-hospital data collection form completed.

This study received ethics approval from the office of the Chief Medical Advisor, National Ambulance, UAE (Approval 12122015).

One hundred and fifty-two patients were treated for suspected ACS during the study period from Feb-Aug 2016 (6-month pilot period).

34 were excluded from analysis for various reasons (withdrew consent, <18 years old, outside RAK area etc.)

118 patients were included in the final dataset for analysis.

A total of 29 of these 118 patients were confirmed as STEMI cases.

In-hospital data were available for 13 of these patients at the time of analysis.

Mean patient age was 51.10 years (SD ± 15.86, range 20–88).

Table 1 outlines demographic details of the STEMI group.

Gender	n (%)
Female	5 (17.24)
Male	24 (82.76)
Age	**years**
Mean	51.10 (SD 15.86)
Nationality	**n (%)**
Asian	3 (10.34)
UAE National	6 (20.69)
European	1 (3.45)
Indian Subcontinent	15 (51.72)
Other Arab nation	2 (6.9)
Other	2 (6.9)

Table 1. Patient demographics (STEMI Group)

Median ambulance response time to patients with STEMI was 7 min (interquartile range [IQR] 7).

The median symptom onset-to-dispatch time was 32 min (IQR 145).

The median dispatch-to-door time was 57 min (IQR 18.7).

14 of the 29 STEMI cases (48%) had a pain score of four or less on assessment.

Of the 29 STEMI patients, cath lab times were available for 12 patients.

The mean door-to-balloon (D2B) time for prehospital triage cases was 77 min (range 48–124, median 73).

This compares with a mean D2B time of 113 min for self-presentations.

Over 80% of prehospital triage STEMI patients had a D2B time of <90 min.

Patients with suspected STEMI who had a prehospital ECG and subsequent PCI performed at SKSH had no mortality (0%) in the study period.

Self-presentations also had no mortality (0%).

No patient (0%) suffered any major adverse cardiac event in the period post-PCI.

Discharge data were available for six patients (21%).

All six patients were discharged home after hospital stays ranging from one to seven days.

All were discharged with independence in activities of daily living; none required assistance; all were expected to have probable improvement in functioning.

In keeping with the existing evidence from established EMS systems worldwide, this pilot study demonstrated agreement with the inclusion of prehospital ECG and prehospital PCI activation in the management of patients with ACS in the United Arab Emirates.

It also supports the assertion that the implementation of an inclusive cardiac care system which includes prehospital ECG and triage to PCI is feasible, safe, and can be implemented in a novel non-ALS clinician setting.

It demonstrated a reduction in D2B timeframes for those patients who present through EMS compared to those who self-present to the ED.

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