London Ambulance Service NHS Trust

ST Elevation Myocardial Infarction

Annual Report: 2006/07

Authors: Dr Rachael Donohoe & Debbie Evans

Clinical Audit and Research Unit
London Ambulance Service NHS Trust
8-20 Pocock Street, London, SE1 0BW

© London Ambulance Service NHS Trust 2007. Not to be reproduced in part or in whole without permission of the copyright holder.

Introduction

This report relates to 808 patients who, between 1st April 2006 and 31st March 2007, were diagnosed by London Ambulance Service NHS Trust (LAS) crews as suffering with an ST-elevation myocardial infarction (STEMI). Information for each of these patients was collected and analysed by the Clinical Audit & Research Unit (CARU) and was derived from Patient Report Forms (PRFs), Mobile Data Terminals (MDTs), 12-lead ECG rhythm strips and Emergency Operations Centre (EOC) records. Where possible, patient outcomes were collected from the receiving hospitals' records and from national databases.

This report presents figures for the LAS as a whole.

Patient Information

The average age of the STEMI patient was 64 years (ranging from 20-98 years). The majority of patients were male (74%). Male STEMI patients were on average 12 years younger than females (61 vs. 73 years respectively).

Type of Infarct

The most common type of infarct was Anterior (47%), closely followed by Inferior (39%).

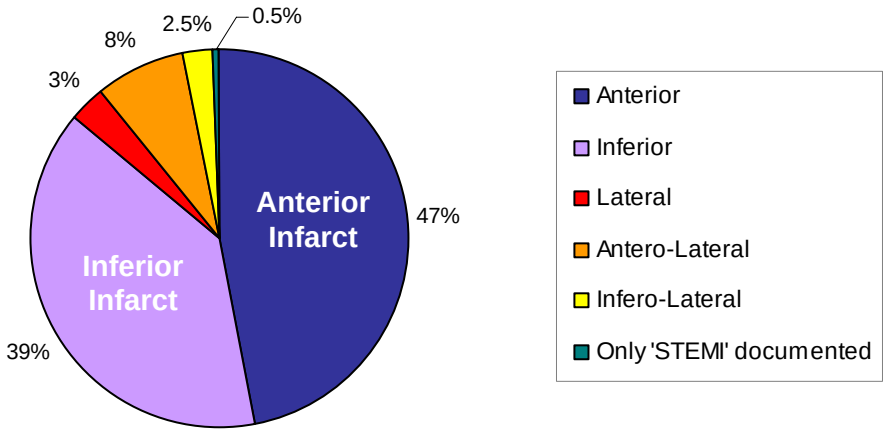

Figure 1. Type of Infarct

Call for Emergency Help

The highest volume of 999 calls for help (47%; n=376) were received between the hours of 9 am and 4 pm, with a peak between 9–10 am (see Figure 2). STEMIs occurred most frequently on a Wednesday (16%; n=129).

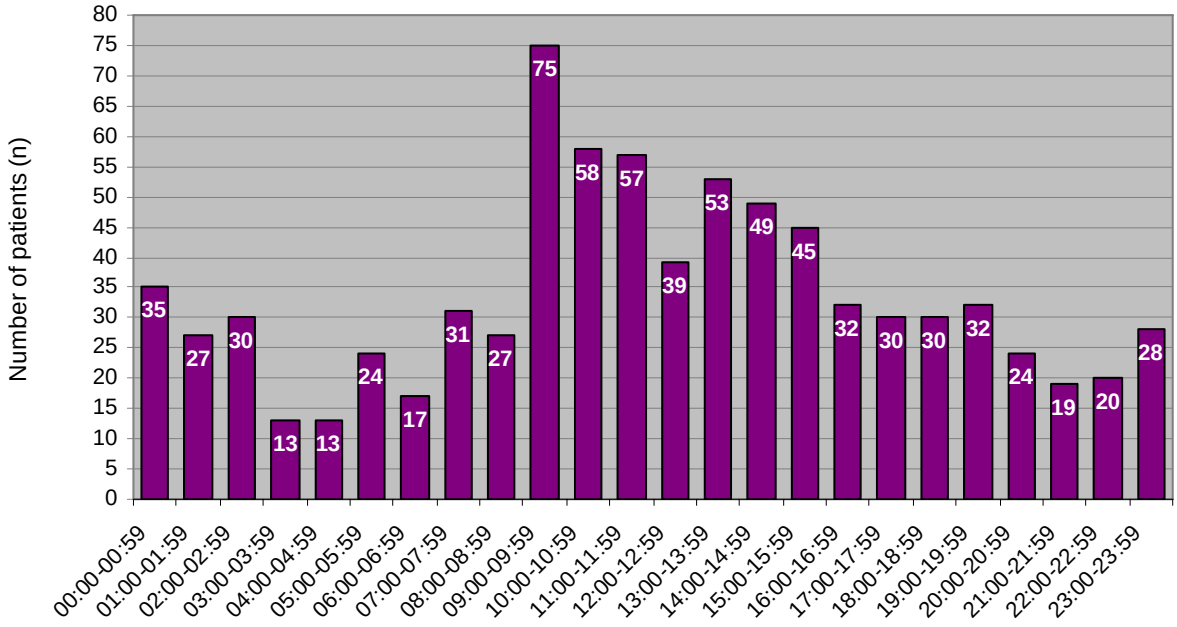

Figure 2. Time of 999 call requesting emergency help

Response Times

The NSF CHD states that people with a suspected myocardial infarction must be attended within 8 minutes of the call for help by an individual who is equipped with, and trained in the use of, a defibrillator.

78% of STEMI patients were attended by LAS crews within the 8 minute target, an increase of 4% from 2005/06.

The average time spent on scene with STEMI patients has increased over the last 3 years from 25 minutes in 2004/05, to 27 minutes in 2005/06 and 30 minutes in 2006/07.

Time Interval	Number of patients^	Average Time (minutes)	Range (minutes)
999 call* – arrival on-scene	804	7	1 - 29
Arrival on scene – arrive patient	652	1	0 - 41
Arrival on scene – leave scene	797	30	11 - 86

^ *Number of patients with both times available.*

* *Time when the incident location and the patient's chief complaint were obtained (ORCON time).*

Assessment and Treatment

Assessment			
	Pain score reported	**Assessed, but not scored**	**Not assessed**
Pain assessment (pre-treatment)	67%; n=538	29%; n=239	4%; n=31
Pain assessment (post-treatment)	63%; n=511	23%; n=187	14%; n=110
Treatment			
	Administered	**Not eligible**	**Not given**
Aspirin	81%; n=654	17%; n=139	2%; n=15
GTN	74%; n=596	23%; n=183	3%; n=28

Pain assessment

An initial (pre-treatment) pain assessment was recorded on 96% of PRFs (67% contained a numerical pain score and 29% reported a qualitative form of pain assessment). 4% of patients did not have any form of pre-treatment pain assessment reported.

86% of patients had a final pain assessment recorded (63% numerical and 23% qualitative). A final pain assessment was not reported for 14% of patients. Although low, this figure represents a 2% improvement since last year when 84% had a pain assessment undertaken.

In total, 84% of patients had both a pre- and post-treatment pain assessment undertaken.

Aspirin

The JRCALC National Clinical Guidelines 2006 state that 'aspirin should be administered to any patient with clinical or ECG evidence of a myocardial infarction' unless the drug is contraindicated.

81% (n=654) of STEMI patients were given aspirin by LAS crews and a further 17% (n=139) were not eligible to receive it (7% had taken aspirin before the arrival of the crew and for 10% aspirin was contraindicated). Thus, 2% of patients should have received aspirin, but did not – and there were no reasons for non-administration reported on the PRFs. This non-administration figure, however, represents an improvement on 2005/06 figures, when 4.5% of patients did not receive aspirin even though they may have been eligible to receive it.

GTN

The JRCALC National Clinical Guidelines 2006 state that 'GTN should be administered to patients with cardiac chest pain due to myocardial infarction' unless the drug is contraindicated.

GTN was administered or contraindicated in 87% of STEMI patients (n=702). Of the remaining 13% (n=106) of patients, 73% (n=77) had GTN administered before arrival of the LAS. In one case it was impossible to know whether GTN had been administered or not because a neighbouring ambulance service treated the patient. In 26% of cases (n=28), GTN was not administered and there were no reasons for this documented on the PRF.

Conveyance Location

All STEMI patients should be taken directly to a Cardiac Catheter Laboratory (Cath Lab) for primary angioplasty (PCTA) or have a clearly documented reason why this care pathway is not appropriate.

Of the 808 STEMI patients included in this report, almost three quarters (74%; n=598) were taken directly to a Cath Lab. A further 12% were appropriately transported directly to A&E. However, 55 patients (7%) were taken to A&E when, according to PRF documentation, they should have gone directly to a Cath Lab.

Direct to Cath Lab	Unsure if taken to Cath Lab or A&E	Direct to A&E	
		With valid reason	Without valid reason
74% (n=598)	7% (n=61)	12% (n=94)	7% (n=55)

Conveyance Response Times

When patients were taken directly to a Cath Lab the journey times were, on average, only 6 minutes longer than the journey times to A&E.

	Number of patients^	Average Time (minutes)	Range (minutes)
999 call* – arrival at Cardiac Cath Lab	587	53	21 - 104
Leaving scene – arrival at Cardiac Cath Lab	586	16	2 - 45
999 call* – arrival at A&E (call to door)	146	47	17 - 88
Leaving scene – arrival at A&E	146	10	1 - 31

^ *Number of patients with both times available.*

* *Time when the incident location and the patient's chief complaint were obtained (ORCON time).*

Reperfusion Times - Primary Angioplasty

273 STEMI patients (34%) were confirmed as receiving primary angioplasty treatment (PTCA) at hospital. Of these, 218 (80%) were admitted directly to a Cath Lab and 55 (20%) were initially transported to A&E by LAS crews.

The average time from 999 call to receiving angioplasty was 101 minutes, 51 minutes of which were accounted for by the hospital.

	Number of patients^	Average Time (minutes)	Range (minutes)
999 call* – primary PTCA *(call to balloon)*	268	101	47 - 370
Arrival at hospital – primary PTCA *(door to balloon)*	264	51	3 - 321

^ Number of patients with both times available.

** Time when the incident location and the patient's chief complaint were obtained (ORCON time).*

Reperfusion Times - Thrombolysis

7 STEMI patients received thrombolytic treatment. 4 (57%) of these patients were taken directly to A&E and 3 (43%) were taken initially to a Cath Lab.

The NSF CHD states that thrombolysis should be given within 60 minutes of calling for professional help. The average call to needle time was 84 minutes, and 3 patients (43%) received thrombolysis within the 60 minute call to needle target. This has seen a gradual decrease over the last 3 years from 55% in 2005/06 and 62% in 2004/05. It is of interest, however, that the 3 longest thrombolysis call-to-needle times were for patients who were taken initially to a Cath Lab.

	Number of patients^	Average Time (minutes)	Range (minutes)
999 call* – thrombolysis *(call to needle)*	7	84	48 - 169
Arrival at hospital – thrombolysis *(door to needle)*	7	37	14 - 121

^ Number of patients with both times available.

** Time when the incident location and the patient's chief complaint were obtained (ORCON time).*

Patient Outcome

Hospital outcome data was available for 354 patients, of which 89% (n=316) were discharged alive. The average stay in hospital for patients who survived to hospital discharge was 6 days.

Conclusions

The findings of this report demonstrate good compliance with clinical guidelines for the treatment of STEMI patients. Documentation of both aspirin administration and pain scoring has improved since last year's report. However, 131 STEMI patients (16%) did not have both a pre- and post-treatment pain assessment.

Nearly three quarters of STEMI patients (74%; n=598) were transported direct to a Cath Lab, a journey which took an average of 53 minutes from the 999 call for help. Primary angioplasty treatment was delivered to patients an average of 1 hour and 41 minutes after receipt of the 999 call by the LAS. Only 7 patients (out of 384 for whom hospital treatment information was available) received thrombolytic treatment.

Points for Action

Crews must be encouraged to facilitate data collection and the reporting of clinical care by:

- Ensuring that all eligible patients are taken directly to a cardiac catheter laboratory or that a valid reason for conveyance to A&E is clearly documented on the PRF.
- Correctly documenting the destination hospital name, code and ward to allow accurate identification of patients directly transported to cardiac cath labs.
- Using illness code 87 for all patients with a confirmed MI by 12-lead ECG.
- Submitting a copy of all 12-lead ECGs to the Clinical Audit & Research Unit (with requests for clinical feedback if desired).