London Ambulance Service NHS Trust

ST Elevation Myocardial Infarction Annual Report: 2007/08

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Introduction

The information in this report relates to 1497 patients who, between 1st April 2007 and 31st March 2008, were diagnosed by London Ambulance Service NHS Trust (LAS) staff as suffering with an ST-elevation myocardial infarction (STEMI). For each patient, information from the Patient Report Form (PRF), Mobile Data Terminal (MDT), 12-lead ECG rhythm strip and Emergency Operations Centre (EOC) record were collected and analysed by the Clinical Audit & Research Unit (CARU). Where possible, patient outcomes were collected from the receiving hospitals' records and from national databases including the Myocardial Infarction National Audit Project (MINAP) database and NHS Strategic Tracing Service (NSTS).

This report presents figures for the LAS as a whole.

Patient Information

The average age of STEMI patients was 62 years (ranging from 11-104 years). As in previous years, the majority of patients were male (76%). Male STEMI patients were on average 14 years younger than females (59 vs. 73 years respectively).

Type of Infarct

The most common type of infarct was Anterior (51%), followed by Inferior (34%).

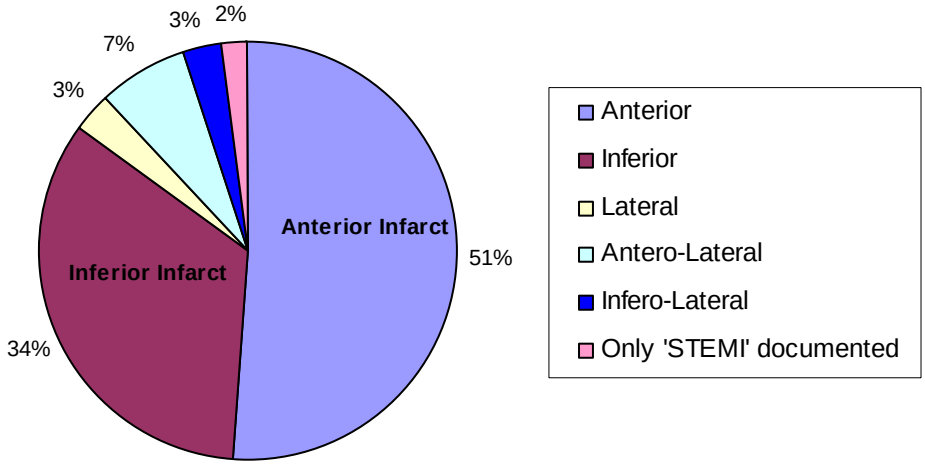

Figure 1. Type of Infarct

Call for Emergency Help

Figure 2 below shows that the highest volume of 999 calls for help (43%; n=638) were received between the hours of 9am and 4pm, with a peak between 11am–12pm. STEMIs occurred most frequently on a Saturday (16%; n=241).

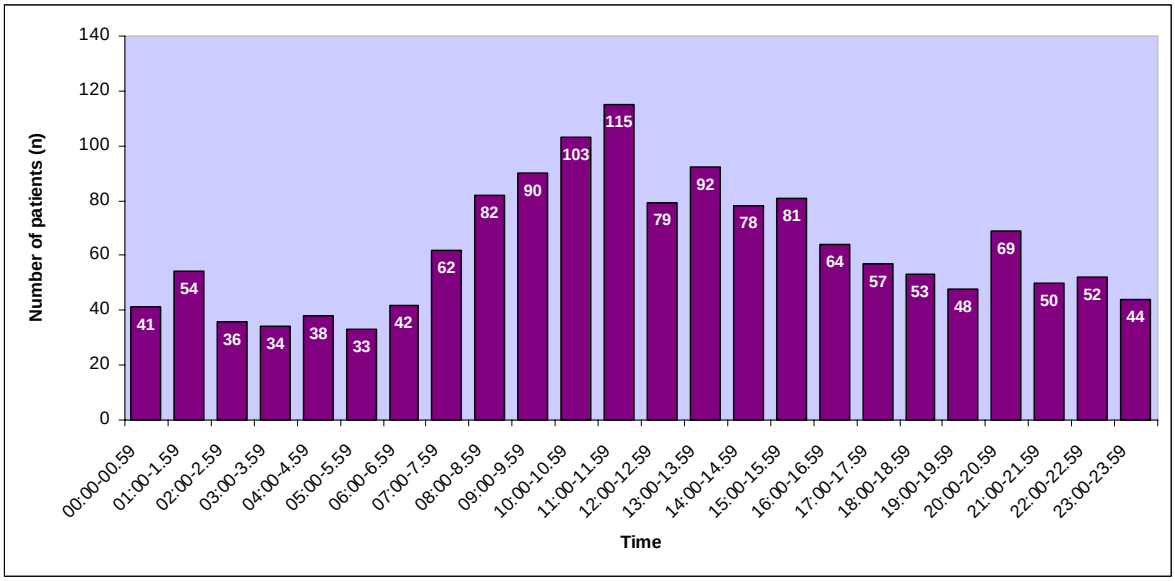

Figure 2. Time of 999 call requesting emergency help

Response Times

From April 2008, all ambulance services in England adopted 'Call connect' as the 999 call start time; this is defined as the time the ambulance service receives the emergency call for help. Prior to this date, the LAS used 'ORCON' time (the time the patient's location and chief complaint were obtained) to define call start. To enable comparison with previous years, and to indicate the impact of changing call start times to Call connect, all response times are reported using both ORCON and Call connect definitions throughout.

The National Service Framework for Coronary Heart Disease (NSF CHD)[1] states that people with a suspected myocardial infarction must be attended to within 8 minutes of the call for help by an individual who is equipped with, and trained in the use of, a defibrillator. 77% of STEMI patients were attended by LAS staff within the 8 minute target, which is a 1% decrease from 2006/07. This figure decreases to 67% of patients being attended within the target when measured using Call connect time. It can be seen in the table that reporting Call connect times also adds an average of 2 minutes onto response intervals.

The average time spent on scene with STEMI patients was 32 minutes. This reflects a year on year increase from 25 minutes in 2004/05, 27 minutes in 2005/06, and 30 minutes in 2006/07.

[1] *Department of Health National Service Framework for Coronary Heart Disease* (2000), HMSO, London.

Time Interval	Number of patients^	Average Time (minutes)	Range (minutes)
999 call* - arrival on scene	1497	7	1 - 95
999 call** - arrival on scene	1497	9	2 - 96
Arrival on scene - arrive patient	1170	1	0 - 55
Arrival on scene - leave scene	1496	32	1 - 107

^ *Number of patients with both times available.*

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

** *Time when the call was connected to the ambulance service (Call Connect time).*

Assessment and Treatment

Assessment			
	Pain score reported	**Assessed, but not scored**	**Not assessed**
Pain assessment (pre-treatment)	77%; n=1146	16%; n=241	7%; n=110
Pain assessment (post-treatment)	76%; n=1145	10%; n=144	14%; n=208
Treatment			
	Administered	**Not eligible**	**Not given**
Aspirin	84%; n=1252	12%; n=177	4%; n=68
GTN	74%; n=1110	25%; n=366	1%; n=21

Pain assessment

93% of PRFs had an initial (pre-treatment) pain assessment recorded; 83% of which contained a numerical pain score and 17% reported a qualitative form of pain assessment. 7% of PRFs did not have any form of pre-treatment pain assessment reported.

86% of patients had a final pain assessment recorded (89% numerical and 11% qualitative). A final pain assessment was not reported for 14% of patients. This figure remains level with last year's performance.

In total, 82% (n=1230) 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.

84% (n=1252) of STEMI patients were given aspirin by LAS staff. A further 12% (n=177) of patients were not eligible to receive aspirin (4% had taken aspirin before the arrival of the crew and for 8% aspirin was contraindicated). 4% (n=68) of patients who should have received aspirin did not and there were no reasons for this reported on the PRFs.

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 in 74% of STEMI patients (n=1110). A further 25% (n=366) of patients were not eligible to receive GTN; 17% (n=247) due to contraindications for GTN administration, 7% (n=110) of patients had received GTN before the arrival of the LAS and 1% (n=9) of patients were not given GTN due to either not providing consent or having a reduced level of consciousness. Therefore, GTN was not administered to 1% (n=21) of patients and there were no reasons documented for non-administration reported on the PRF.

Conveyance Location

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

Of the 1497 STEMI patients included in this report, 86% (n=1280) were taken directly to a Cath Lab. A further 3% were appropriately transported directly to A&E. However, 123 patients (8%) were taken to A&E when, according to PRF documentation, they should have been transported directly to a Cath Lab. In addition, it was not possible to identify from the PRF whether a further 3% of patients were taken to a Cath Lab or A&E.

Direct to Cath Lab	Direct to A&E		Unsure if taken to Cath Lab or A&E
	With valid reason	Without valid reason	
86% (n=1280)	3% (n=50)	8% (n=123)	3% (n=44)

Conveyance Response Times

Journey times for patients taken directly to a Cath Lab were, on average, only 2 minutes longer than the journey times to A&E. For both destinations, using Call connect can be seen to add an average of 2 minutes onto the response time intervals.

	Number of patients^	Average Time (minutes)	Range (minutes)
999 call* - arrival at Cardiac Cath Lab	1278	55	23 - 157
999 call** - arrival at Cardiac Cath Lab	1278	57	26 - 158
Leaving scene - arrival at Cardiac Cath Lab	1277	16	1 - 62
999 call* - arrival at A&E (call to door)	170	53	24 - 166
999 call** - arrival at A&E (call to door)	170	55	26 - 167
Leaving scene - arrival at A&E	170	13	1 - 135

^ *Number of patients with both times available.*

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

** *Time when the call was connected to the ambulance service (Call Connect time).*

Reperfusion Times - Primary Angioplasty

Of 344 patients confirmed as receiving reperfusion treatment, 250 patients (73%) were confirmed as receiving primary angioplasty treatment (PTCA) at hospital. Of these, 225 (90%) were admitted directly to a Cath Lab and 13 (5%) were initially transported to A&E by LAS staff. In addition, there were 12 cases (5%) where it was unclear as to whether the patient was transported to a Cath Lab or A&E.

The average time from 999 call to receiving angioplasty was 98 minutes; 45 minutes of which were accounted for by the hospital. It can be seen from the table that reporting Call connect times adds an average of 1 minute to response intervals.

	Number of patients^	Average Time (minutes)	Range (minutes)
999 call* - primary PTCA *(call to balloon)*	242	98	47 - 217
999 call** - primary PTCA *(call to balloon)*	242	99	48 - 219
Arrival at hospital - primary PTCA *(door to balloon)*	242	45	3 - 162

^ *Number of patients with both times available.*

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

** *Time when the call was connected to the ambulance service (Call Connect time).*

Reperfusion Times - Thrombolysis

6 STEMI patients received thrombolytic treatment; 2 (33%) of these patients were taken directly to A&E and 2 (33%) were taken initially to a Cath Lab. There were 2 cases (33%) where it was unclear as to whether the patient was transported to a Cath Lab or to A&E.

The NSF CHD states that thrombolysis should be given within 60 minutes of calling for professional help. Of the 6 cases, 5 had a call to needle time available; the average of which was 100 minutes. An average of 2 minutes is added to the response times when reporting on Call connect time. 2 patients (33%) received thrombolysis within the 60 minute call to needle target. Interestingly, the longest thrombolysis call-to-needle times were for the 2 patients taken initially to a Cath Lab.

	Number of patients^	Average Time (minutes)	Range (minutes)
999 call* - thrombolysis *(call to needle)*	5	100	52 - 175
999 call** - thrombolysis *(call to needle)*	5	102	53 - 178
Arrival at hospital - thrombolysis *(door to needle)*	5	59	13 - 138

^ *Number of patients with both times available.*

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

** *Time when the call was connected to the ambulance service (Call Connect time).*

Patient Outcome

Patient outcome data was available for 411 patients, of which 96% (n=395) were discharged alive. Of these, 389 patients had data available on their length of stay in hospital. The average stay in hospital for patients who survived to hospital discharge was 5 days.

Conclusions

In comparison to previous years, the number of STEMI patients reported this year has almost doubled (from 808 in 2006/07 to 1497 patients in 2007/08). This is likely to be the result of a number of factors, including the introduction of a monthly Cardiac Care Pack in February 2007 which is used by local management teams to monitor and improve upon the care given to STEMI patients. In addition, during 2007/08 there were increased levels of feedback to staff from Team Leaders via the LAS Clinical Performance Indicator (CPI) process on PRF documentation of information such as illness codes. The submission of 12-lead ECG strips has also become more frequent and, together with improvements in data systems, has meant that CARU are more able to capture data on STEMI patients more accurately.

The findings of this report demonstrate good compliance with clinical guidelines for the treatment of STEMI patients with aspirin and GTN. Although initial pain assessments are undertaken in the majority of patients, documentation of both pre- and post-treatment pain assessment still requires improvement with 18% of cases not having both pain assessments undertaken. It is of interest that the proportion of pain assessment undertaken in numerical form has increased by 16% for initial pain assessment and 26% for final pain assessment since last year. Again, this may be reflective of the use of STEMI data from the monthly Cardiac Care Pack by local management teams to improve clinical care and increased CPI feedback to staff from Team Leaders.

Over three quarters of STEMI patients (86%; n=1280) were transported directly to a Cath Lab which has increased by 12% from last year. The average time from the 999 call for help to arrival at the Cath Lab and A&E was 55 minutes and 53 minutes respectively. Hospital treatment information was available for 344 patients. Primary angioplasty treatment was delivered to 250 patients, which on average was 1 hour and 38 minutes after receipt of the 999 call by the LAS. Only 6 patients were confirmed to have received thrombolytic treatment.

Points for Action

Staff should be encouraged to facilitate data collection and the reporting of clinical care by:

- Recording both pre- and post-treatment pain assessments, using numerical scores wherever possible.
- Ensuring that all eligible patients are taken directly to a Cath Lab 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 Management Information (with requests for clinical feedback if desired).