Abstracts

1 ROUTE OF ADMISSION IN STEMI: DO PATIENTS WHO PRESENT DIRECTLY TO A PCI-CAPABLE HOSPITAL DIFFER FROM INTER-HOSPITAL TRANSFERS?

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Background Rapid delivery of reperfusion therapy with PPCI is the gold standard treatment in STEMI. Systems have been developed, such as direct admission to a PCI-capable hospital, to minimise the time from diagnosis to PPCI. Despite this, a significant minority of patients are initially admitted to non-PCI capable hospitals. The aim of this study was to determine whether patients differed in their characteristics, time to PPCI, and outcome by route of admission.
Methods The study was performed in a single tertiary centre in North England. Data are collected routinely on all patients undergoing PPCI and include demographic, clinical and procedural variables. In-hospital MACCE (death, re-infarction or CVA) and mortality are collected providing relevant outcome measures. Baseline clinical variables by route of admission were compared and unadjusted in-hospital MACCE rates determined. One-year mortality by route of admission was calculated using the K-M product limit estimate. In-hospital and 1-year outcomes were analysed after adjustment for factors known to be predictors of early mortality following STEMI (models 1 and 3). To determine the relative importance of delays in treatment, call-to-balloon time was added (models 2 and 4). Logistic regression was used for the adjusted in-hospital outcomes, and Cox-proportional regression for adjusted 1-year mortality.
Results 2268 patients were included in the analysis. 510 patients (22.5%) were treated with PPCI following transfer from a non-PCI capable centre. Analysis of baseline variables (Abstract 1 table 1) showed the transfer group were more likely to have an LAD occlusion treated, and previous MI. Despite shorter DTB times, the transfer group had a greater median CTB time (52 minutes longer) compared with direct admissions. Other baseline variables were statistically no different between groups. There were 110 in-hospital MACCE events, and 168 deaths within 1-year follow-up. The transfer group had significantly higher unadjusted in-hospital MACCE rates (2.4% absolute, 58% relative increase (Abstract 1 table 2)). At 1 year, the transfer group had significantly higher unadjusted mortality (2.7% absolute, 48% relative increase (Abstract 1 table 2)). After adjustment for relevant co-variates (models 1 and 3) route of admission remained a significant predictor of in-hospital and 1-year mortality. With the addition of call-to-balloon time, no significant difference in outcome was noted by route of admission for either in-hospital or 1-year events.

Abstract 1 Table 1

	Direct	Transfer	p
Age (years±SD)	64.3 (12.7)	63.9 (12.4)	0.17
Male	1252 (71.2)	367 (72.0)	0.74
Diabetes	177 (10.1)	55 (10.8)	0.68
Previous MI	225 (12.6)	89 (17.3)	0.001
Treated vessel			0.001
LMS	24 (1.4)	13 (2.5)	
LAD	630 (36.1)	218 (42.9)	
LCx	249 (14.3)	83 (16.3)	
RCA	812 (46.6)	188 (37.0)	
Graft	28 (1.7)	5 (1.1)	
Cardiogenic shock	28 (1.7)	35 (6.9)	0.61
Smoking (ex/current)	1331 (75.7)	377 (73.9)	0.42
Call-to-balloon time	102 (82–135)	154 (107–235)	<0.001
Door-to-balloon time	44 (29–76)	34 (24–50)	<0.001

Abstract 1 Table 2

	Direct	Transfer	OR (±95% CI)	p
In-hospital MACCE	4.3%	6.7%	1.58 (1.04 to 2.39)	0.03
Adjusted in-hospital MACCE (model 1)			1.64 (1.00 to 2.28)	0.05
Adjusted in-hospital MACCE (model 2)			1.34 (0.79 to 2.29)	0.27

	Direct	Transfer	HR (±95% CI)	p
1-year mortality	7%	9.7%	1.48 (1.06 to 2.07)	0.02
Adjusted 1-year mortality (model 3)			1.41 (0.99 to 2.01)	0.05
Adjusted 1-year mortality (model 4)			1.29 (0.87 to 1.89)	0.20

Conclusion In this study, patients who presented directly had superior in-hospital and 1-year outcomes compared with those who required transfer from other hospitals. Adjustment for longer call-to-balloon times attenuated the finding of poorer outcomes in these patients, suggesting that delays in treatment are critical. Systems of care should be designed to avoid admission of STEMI patients to non-PCI hospitals, and facilitate more rapid transfer of patients where this has not been possible.

2 A "DIRECT" TRANSFER PROTOCOL FOR PATIENTS WITH NON ST-ELEVATION MYOCARDIAL INFARCTION REDUCES TIME TO CORONARY ANGIOGRAPHY

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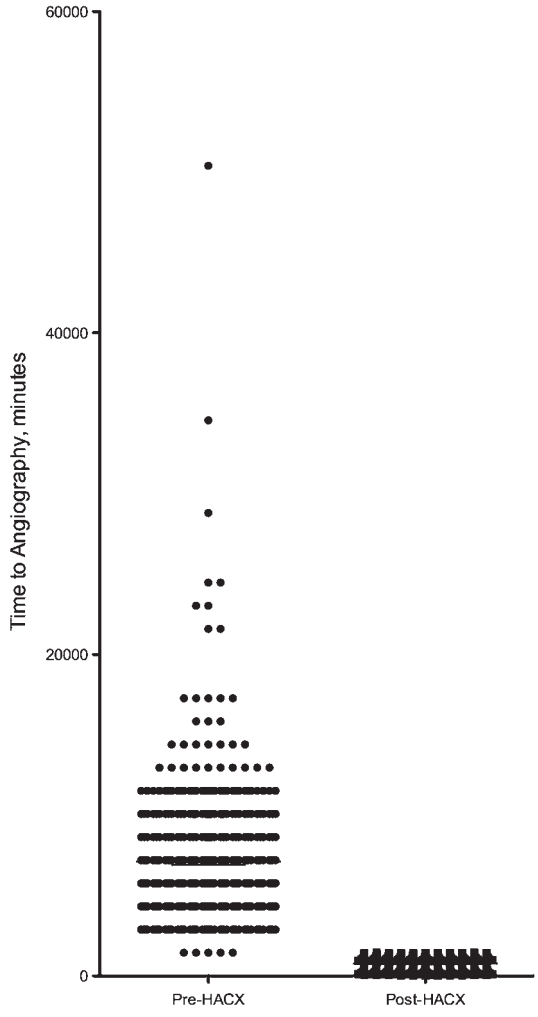
Introduction Patients with non-ST elevation myocardial infarctions (NSTEMI) are at high risk of further cardiac events. National guidelines recommend "early" coronary angiography within 96 h of presentation. Most patients with NSTEMI present to their district general hospital (DGH), and await transfer to the regional cardiac centre for angiography. This care model has inherent time delays, and delivery of early angiography is problematic.
Methods A novel clinical care pathway for the management of NSTEMI, known locally as the Heart Attack Centre-Extension or HAC-X, has been investigated. This pathway identifies patients with NSTEMI by clinical assessment and rapid point-of-care troponin testing while in the emergency department (ED). Patients meeting criteria for urgent transfer receive evidence based medical therapy for NSTEMI (see Abstract 2 table 1) in the ED, and are transferred to the tertiary centre within 1 h without referral. All unstable patients are taken straight to the cardiac catheterisation laboratory. For stable patients, coronary angiography is undertaken on the same day, or if patients arrive after 17:00 on the next available routine list. The study group consists of 775 patients divided into two groups; 464 patients treated before the instigation of the HAC-X pathway (Pre-HACX), and 311 patients treated via the novel pathway (Post-HACX). We have undertaken a prospective observational study of post-HAC-X patients, assessing need for angiography and or revascularisation along with discharge diagnosis. We have also compared the waiting time for angiography of pre-HAC-X and post-HAC-X groups.
Results 250/311 (80.4%) of HACX patients underwent angiography. Following angiography, 144/250 (57.6%) were treated with coronary revascularisation (108 (75%) PCI and 36 (25%) CABG). 106/250

Abstract 2 Table 1 Inclusion and exclusion criteria for HACX

Inclusion criteria	Symptoms suggestive of myocardial ischaemia
	With ECG changes including: ST depression; T wave inversion in V1-4; Dynamic T wave changes
	OR positive troponin I assay
Exclusion criteria	Unexplained anaemia (Hb<10)
	Hypoxia
	Acute renal failure
	Loss of consciousness
	Recent trauma
	Overt sepsis
Immediate medical therapy includes	Aspirin 300 mg
	Clopidogrel 600 mg
	Fondaparinux 2.5 mg
	Eptifibatide bolus (180 mg/kg) as long as no bleeding contraindications

(42.4%) of patients were treated with medical therapy alone. NSTE-ACS (encompassing NSTEMI and unstable angina) was the discharge diagnosis for 75.4% of HACX patients. 10% of patients had another cause for chest pain symptoms (including pericarditis and, myocarditis); 14.6% had a non-cardiac diagnosis. Mean time from presentation to angiography was pre-HAC-X 7349 mins (±6836) and post HAC-X 754 mins (±458) (p<0.0001) (see Abstract figure 1). Pre-HAC-X mean wait for transfer to tertiary centre was 4.1 (±4.7) days. Median length of stay for HACX patients was 3 days. HAC-X has reduced wait for coronary angiography by 3.4 days per patient.



Abstract 2 Figure 1 Time from ED presentation to coronary angiography.

Conclusions This novel care pathway allows delivery of early angiography to NSTEMI patients in accordance with national guidance. Importantly, the pathway allows accurate diagnosis of NSTEMI, and inappropriate transfers are infrequent. Its introduction has resulted in a significant reduction in time to angiography for NSTEMI patients, and significant reductions in total hospital bed occupancy for patients with NSTEMI.

3 SURVIVAL FOLLOWING ACUTE MYOCARDIAL INFARCTION IN PATIENTS OF SOUTH ASIAN AND WHITE EUROPEAN ETHNICITY IN THE UK

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Introduction Some UK studies have suggested higher case-fatality rates following acute myocardial infarction (AMI) in British South Asian (SA), compared to white European (WE) people, driven by higher prevalence of diabetes in the SA ethnic group. However other studies have suggested similar or even better adjusted overall post-AMI survival for these ethnic groups. In patients with AMI, both prior diagnosis of diabetes as well as acutely elevated blood glucose regardless of diabetes status are associated with adverse outcomes. The aim of this study was to compare survival rates following AMI in SA and WE patients drawn from a contemporary, multi-ethnic UK population.

Methods: We conducted a retrospective cohort study of total 4111 (SA 18%) consecutive patients with AMI admitted between October 2002 and September 2008. Baseline differences between the ethnic subgroups were examined using independent two-sample t tests for continuous and χ^2 tests for categorical variables. Cox regression models were constructed to identify determinants of 30-days and 1-year mortality, entering ethnicity, random admission blood glucose and antecedent diabetes individually and together along with other relevant variables.

Results: SA patients were younger (62 vs 67 years, p<0.005) and less likely to have smoked (16% vs 40%, p<0.005) but more likely to have hypertension (55% vs 49%, p=0.004) or diabetes (40% vs 16%, p<0.005) at presentation compared to WE patients. All cause 30-day and 1-year mortality proportions were 10.0 % and 15.2% in SA compared to respectively 9.9 % and 16.7 % in WE patients. For SA ethnicity, the univariate HR of 30-day mortality was 1.01 (95% CI 0.79 to 1.30) compared to WE ethnicity. On multivariate analysis (excluding antecedent diabetes and admission blood glucose) this association of SA ethnicity and mortality became significant (HR 1.56, CI 1.10 to 2.23) and remained so when antecedent diabetes was added to the analysis (HR 1.48, CI 1.03 to 2.13). However when admission blood glucose was added to the model, association of ethnicity with mortality became non-significant (HR 1.31, CI 0.86 to 1.99). Conversely each unit (mmol/l) increase in admission blood glucose was associated with 7% increase in mortality (HR 1.07, CI 1.04 to 1.10) in this model, after adjusting for all the covariates. Furthermore exclusion of ethnicity and antecedent diabetes from the model did not alter the predictive value of admission blood glucose (HR 1.08, CI 1.05 to 1.10). Similar associations were observed for 1-year mortality.

Conclusions Despite higher prevalence of diabetes in SA patients, their mortality post AMI was similar to WE patients. Furthermore, admission hyperglycaemia more so than antecedent diabetes was an important predictor of increased mortality post AMI. To improve survival, active management of admission hyperglycaemia should be considered in patients admitted with AMI, regardless of their diabetes status or ethnicity.