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Pre-Hospital Fast Positive Cases Identified by DFB Ambulance Paramedics – Final Clinical Diagnosis

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Abstract

Ischaemic stroke clinical outcomes are improved by earlier treatment with intravenous thrombolysis. An existing pathway at the Mater University Hospital for assessment of suspected acute stroke in the Emergency Department was updated, aiming to shorten 'door to needle time'. This study examines the final clinical diagnosis of Dublin Fire Brigade Ambulance Paramedic identified Face Arm Speech Test (FAST) positive patients presenting to the Emergency Department over a 7 month period. A retrospective analysis was carried out of 177 consecutive FAST positive patients presenting between March and November 2014. The final clinical diagnosis was acute stroke in 57.1% (n=101) of patients. Of these, 76 were ischaemic strokes of whom 56.5% (n=43) were thrombolysed. In the pre-hospital setting Ambulance Paramedics can identify, with reasonable accuracy, acute stroke using the FAST test. Over half of the ischaemic stroke patients presenting via this pathway can be treated with intravenous thrombolysis.

Introduction

Earlier treatment of acute ischaemic strokes with intravenous thrombolysis is known to reduce disability¹. Many studies, however, show low treatment rates and significant regional variation. In Holland, thrombolysis rates of 5.7%-21.7% were reported over 12 centres². In the USA, amongst Medicare beneficiaries in 2007-2010, a treatment rate of 3.7% was found³. An additional 7,000 patients per annum would be treated if all regions performed at the level of the 75th percentile. In the UK in 2008, 26% of ischaemic stroke patients were eligible for treatment, yet only 1.4% of patients were thrombolysed⁴. Clinical guidelines recommend acute hospital pre-notification by Emergency Services of suspected acute stroke patients^{5,6}. In Ireland, the National Ambulance Service utilises the Face Arm Speech Test (FAST). The FAST test has been shown to have good sensitivity but limited specificity⁷. Documentation of a pre-hospital stroke scale increases sensitivity and positive predictive value (PPV) of pre-hospital stroke recognition and improves acute stroke treatment⁸. Using Lean Health Care methodology, an existing pathway in the Mater Hospital for assessment of suspected acute stroke was updated, aiming to shorten 'door to needle time'.

Methods

Admission records review identified 177 consecutive pre-notified 'FAST positive' patients presenting to the Emergency Department between March and November 2014. Date and time of presentation, presentation during regular or 'on call' hours,

type(s) of initial neuroimaging, whether tPA was administered and the final clinical diagnosis were recorded. Acute strokes and stroke mimics were defined by the final diagnosis on discharge, decided by the treating stroke physician.

Results

One hundred and seventy-seven patients (54.8% Male, 45.2% female) were included. Age range was 18-97 years (median 69 years). Sixty-seven point-eight percent presented outside normal working hours, 95.5% underwent immediate imaging (CT Brain, CT Angiogram), and 86.8% of patients with acute ischaemic stroke underwent both. In total, 57.1% (n=101) had a final diagnosis of acute stroke. Of these, 75% (n=76) were ischaemic and of these, 56.5% (n=43) were thrombolysed. Two stroke mimics were treated. Patient age and time of presentation had no significant impact on the proportion with final diagnosis of acute stroke (62.1% age 80 and over versus 54.5% age < 80 and 60% during regular hours versus 57.5% outside regular hours).

Discussion

Intravenous thrombolysis is the only licensed drug therapy for acute ischaemic stroke that has been proven to lessen patient disability. We have shown that a high percentage of acute ischaemic stroke patients who present early to hospital can be treated (56.5%). The importance of system-wide organization of acute stroke services is further emphasized by recent findings in the USA, at 'Get with the Guidelines' Stroke Hospitals, of an increase in treatment rate of fully eligible patients arriving within 2 hours of symptom onset from 42.6% in 2003-5 to 77% in 2010-11⁹. We believe that additional progress can be made in Ireland to further increase treatment rates. This study does not include the winter peak in stroke incidence. Whether this would impact on the accuracy of FAST is unknown. We do not have data on the number of FAST patients bypassing affiliated hospitals through bypass protocols. It was also not possible to calculate sensitivity or false negative figures for the FAST assessment, from the data collected. Nearly 60% of FAST positive patients identified by Ambulance Paramedics had a final diagnosis of acute stroke. This figure is less than the positive diagnosis rate of 83% previously reported by Harbison et al¹⁰ indicating that further education and training of staff is required. Two thirds of strokes presented out of hours. This demonstrates the importance of acute stroke training for all on-call health care staff spanning the pre-hospital and acute hospital settings as well as highlighting the need to have adequately resourced diagnostics and specialist stroke clinicians available 24/7 in hospitals receiving acute stroke patients.

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References

1. AHA 2013 Guidelines on Early Management of Patients with Acute Ischemic Stroke. Stroke 2013;44:870-947

2. Van Wijngaarden JDH, Dirks M, Huijsman R, Niessen L, Fabbricotti IN, Dippel DWJ et al. Hospital Rates of Thrombolysis for Acute Ischemic Stroke- The Influence of Organizational Culture. *Stroke* 2009; 40:3390-3392
3. Skolarus LE, Meurer WJ, Shanmugasundaram K, Adelman EE, Scott PA, Burke JF. Marked Regional Variation in Acute Stroke Treatment Among Medicare Beneficiaries. *Stroke* 2015; 46:1890-6
4. Rudd AG, Hoffman A, Grant R, Campbell JT, Lowe D. Stroke thrombolysis in England, Wales and Northern Ireland: how much do we do and how much do we need? *J Neurol Neurosurg Psychiatry* 2011;82:14-9
5. AHA 2013 Guidelines on Early Management of Patients with Acute Ischaemic Stroke. *Stroke* 2013; 44: 870-947
6. ESO 2008 Guidelines on Management of Stroke and TIA. *Cerebrovasc Dis.* 2008; 25: 457-507
7. Rudd MP, Price C, Ford GA. Prehospital stroke scales in urban environments: A systematic review. *Neurology* 2015; 84: 962
8. Oostema JA, Konen J, Chassee T, Nasiri M, Reeves MJ. Clinical Predictors of Accurate Prehospital Stroke Recognition. *Stroke* 2015; 46:1513-7
9. Schwamm LH, Ali SF, Reeves MJ, Smith EE, Saver JL, Messe S, Saver JL, Messe S, Bhatt DL, Grau-Sepulveda MV, Peterson ED, Fonarow GC. Temporal trends in patient characteristics and treatment with intravenous thrombolysis among acute ischemic stroke patients at Get with the Guidelines-Stroke Hospitals. *Circ Cardiovasc Qual Outcomes* 2013; 6: 543-9
10. Harbison J, Massey A, Barnett L, Hodge D, Ford GA. Rapid ambulance protocol for acute stroke. *Lancet* 1999; 353: 1935