

1. Introduction

- Stroke is a medical emergency affecting 150,000 people in the UK each year (Fig 1). Paramedics should use the Face Arm Speech Test (FAST) to identify it.



Fig 1. Angiogram showing the flow of blood in a healthy brain. Stroke causes a disruption of this blood flow.

- Within 4.5 hours of onset the recommended treatment of suitable cases is thrombolysis by intravenous recombinant tissue plasminogen activator.^[1]
- No system of pre-hospital assessment for thrombolysis eligibility currently exists. However, paramedic reports inform hospital thrombolysis decisions.

2. Aim

- To describe how paramedic pre-hospital assessment of stroke patients and their thrombolysis eligibility could be improved.

3. Methods

- Setting:** Wansbeck General Hospital, North Tyneside General Hospital and Hexham General Hospital.
- Design:** Community onset stroke admissions during the period May 2012 - June 2013 were identified using Stroke Improvement National Audit Program (SINAP) and Sentinel Stroke National Audit Program (SSNAP) hospital databases at Northumbria Healthcare NHS Foundation Trust.
- Data were collected from anonymous paramedic incident reports obtained from North East Ambulance Service.
- There is no link between paramedic reports and hospital audit data so these were compiled together manually.
- Chi-squared and Independent Mann Whitney U Tests were performed using Statistical Package for the Social Sciences (SPSS) version 19 (IBM).
- Data collection:** Onset time, Face Arm Speech Test (FAST), blood pressure, consciousness level, history and paramedic impression of the chief complaint were extracted.

4. Key Results and Discussion

- 460 of the 710 ambulance stroke admissions were obtained and suitable. A limitation of the study was that paper records were omitted.
- FAST was recorded in 63% of cases. 19% performed an examination like the FAST but did not complete the FAST record section.
- Paramedic FAST sensitivity was 63% (Fig 2), lower than original studies (81%).^[2]
- “Inconclusive” results were recorded in 18% of cases and negative results in 19%.
- FAST was recorded in 45% males vs. 76% females. Male gender was significantly associated with not receiving a FAST ($P=0.01$) or any FAST-like test ($P=0.01$) perhaps because elderly males have more masking comorbidities than elderly females.
- Lower conscious level (Glasgow Coma Scale <8) was significantly associated with reduced FAST administration ($P<0.001$) and reduced identification of stroke ($P=0.03$).
- In 99 cases (22%), paramedics failed to report an onset time for a witnessed stroke but the hospital identified a time. 60 of these patients had an onset-to-paramedic time of <3 hours, potentially making them eligible for thrombolysis.
- Where both paramedic and hospital time were available (157 records), 82% agreed within 1 hour.
- Relevant past medical history was recorded in 84% of cases with a higher success rate in those conditions routinely checked for in normal paramedic practice and less in those pertinent to stroke (Fig. 3). It did not appear that paramedics actively looked for conditions relevant to thrombolysis.
- Drug history was documented in 12% of cases. Anticoagulant status was recorded correctly in only 6/63 anticoagulated patients (9.5%).

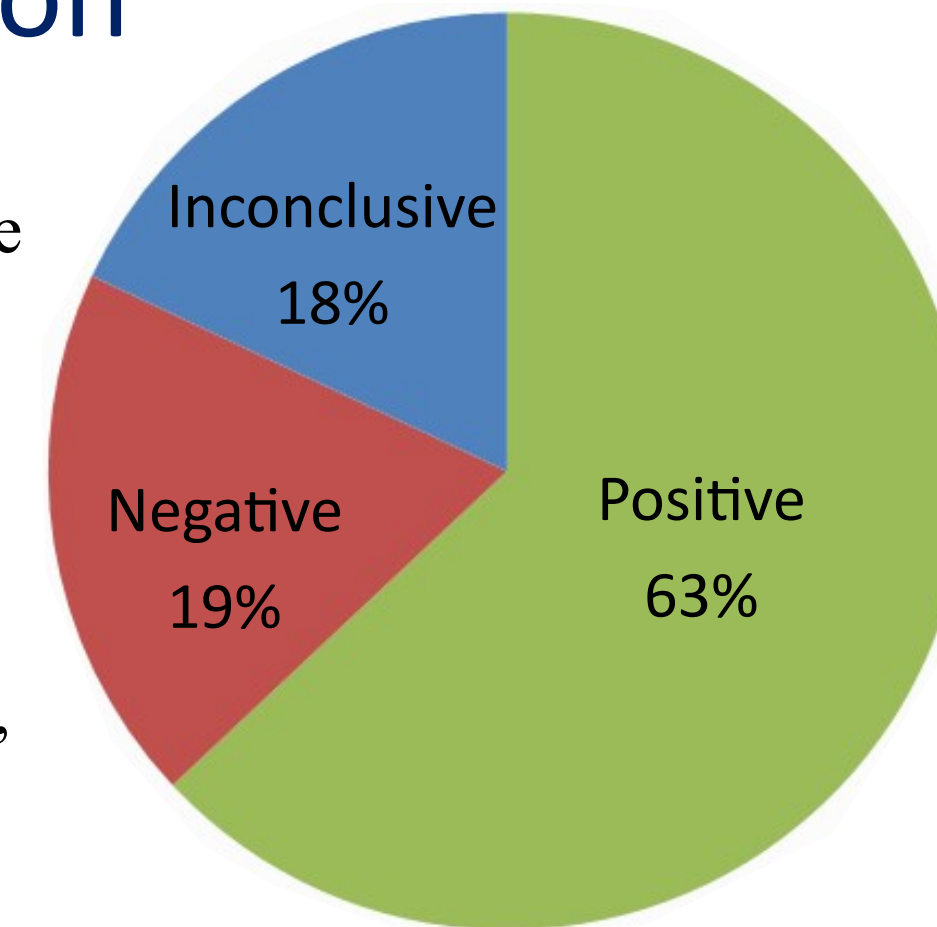


Fig 2. FAS Test results breakdown

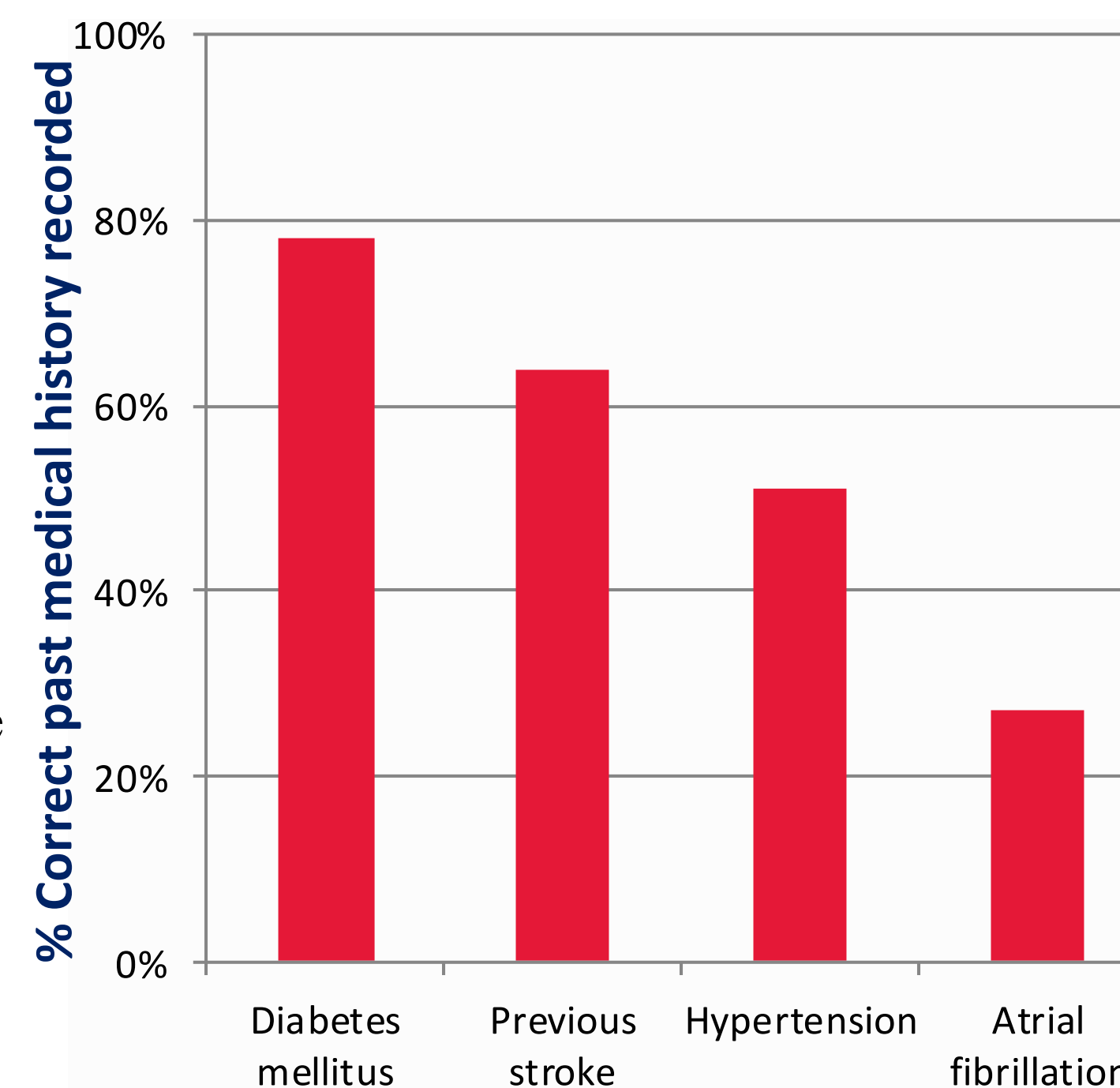


Fig 3. Success rate of paramedic past medical history

5. Conclusions

- Approximately 2/3 of emergency stroke admissions had a FAST recorded.
- Paramedics do not routinely gather additional information for thrombolysis decisions.
- A simple structured approach may improve paramedic assessment for stroke thrombolysis potential. When stroke is suspected, **FOAM**:

F

- FAST** to be performed and documented by name.
- Removal of the “inconclusive” option.
- Training in applying FAST to elderly males with comorbidities.

O

- Onset** time should be a priority of assessment.

A

- Anticoagulant** status should be recorded routinely.

M

- Medical** history should be taken including diabetes, hypertension, previous stroke and atrial fibrillation.

- The possibility of thrombolysis should always be considered in suspected stroke.
- Further research could trial a paramedic training intervention.

6. Citations & Acknowledgements

- ^[1] National Institute for Health and Care Excellence, *TA264 Stroke (acute, ischaemic) - alteplase: guidance* 2012, National Institute for Health and Care Excellence: London.
- ^[2] Whiteley, W.N., et al., *Clinical scores for the identification of stroke and transient ischaemic attack in the emergency department: a cross-sectional study*. Journal of Neurology, Neurosurgery & Psychiatry, 2011. **82**(9): p. 1006-10.
- Figure 1 - Angiogram of posterior cerebral circulation. *Creative Commons, unattributed*.
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