Paramedic Stroke Mimic Telemedicine Project

NHS East of England Stroke Telemedicine Partnership

Overview

The *Paramedic Stroke Mimic Telemedicine Project* was initially established to explore the use of videoconferencing technology to support registered paramedics from the East of England Ambulance Service NHS Trust (EEAST) in their pre-hospital assessment of suspected stroke mimic patients. The aim of the project was to explore if telemedicine could be used to prevent Emergency Department (ED) admission of stroke mimic patients.

Telemedicine has been very successfully utilised within the East of England as a platform for the out of Hours stroke thrombolysis service. Operational since November 2010, this service provides rapid access to a Stroke Consultant to support decision making for acute ischaemic stroke patients who are potentially thrombolysable. However, a significant proportion of suspected strokes are subsequently diagnosed as stroke 'mimics'; an estimated 40-50% of all stroke presentations (Gibson & Whitely, 2013). Conditions mimicking stroke include seizures, space occupying lesions, Bell's palsy and hypoglycaemia, amongst others.

All stroke mimics require accurate assessment and may require further treatment.

Utilising telemedicine technology to provide access to stroke expertise for thrombolysis has been acknowledged as an appropriate tool to support decision-making (BASP, 2014 &, RCP, 2016). Demaerschalk, Miley, Kiernan et al (2009) concluded that collaboration between emergency medicine and neurology practitioners is probably the most important element of a successful telestroke programme. Therefore, effective early triage and identification of 'true' stroke patients is essential across the whole health economy.

The initial Paramedic Stroke Mimic Telemedicine Project ran as a feasibility project and was operational Monday - Friday 09:00 hr - 16:00hrs; commencing on 1st October 2018 – July 2019. The aim was to assess 50 patients using the telemedicine system to assess feasibility over an anticipated 6-month period (whichever achieved first).

The overall projects aims were to:

1. *Inform feasibility of telemedicine usage in the pre-hospital setting for stroke or Transient Ischaemic Attack (TIA) patients*

2. *Determine possible impact on outcome and stroke mimic rates*

3. *Gather information about the patient experience*

This feasibility project was supported with a £5,000 bursary from the Eastern Academic Health Science Network (Eastern AHSN) as part of their Digital Project Pioneer Programme[1]. The Digital Pioneer Programme is one of eight initial projects aimed at improving the use of digital technology in the NHS across the East of England. The overall aims of the Programme are to provide new, more efficient ways to treat, monitor and keep clinicians connected to patients and form part of the region's Sustainability and Transformation Partnerships' (STPs) Plans.

The paramedic had the ability to consult directly with hospital-based Stroke Consultants using the existing videoconferencing telemedicine system (Visionable[2]) and had participated in a HyperAcute Stroke Study Day on identifying and assessing stroke mimic patients.

In this feasibility phase, a total of 12 paramedics had access, via the Visionable app on a iPhone or iPad, to one of the Stroke Consultants at Ipswich Hospital.

The 12 registered paramedics attended the Hyper-Acute Stroke Study Day in September 2018 and January 2019 (2 cohorts) at the Postgraduate Education Centre at Ipswich Hospital. Dr Kayvan Khadjooi, Education Lead for the East of England Stroke Telemedicine Partnership, delivered the Study Day, which consisted of:

- Pre-course reading of two articles – the first focusing on risk factors for stroke and the second outlining acute stroke identification and management (Sibson & Khadjooi, 2017 & Sibson & Khadjooi 2018)

- Short online quiz based on two articles related to stroke risk factors and management accessible via Microsoft Forms

- The HyperAcute Stroke Study Day focused on neurovascular and altered anatomy and physiology, stroke assessment and recognising stroke mimics, thrombolysis indications and the ROSIER assesment tool used for this project

The Study Day is supported by the College of Paramedics and each paramedic received a Certificate of Attendance for their Portfolio. Feedback from paramedics was very positive - one paramedic stating that is was their 'best training day since qualifying'.

Shortly afterwards the paramedics were all supplied with either an iPad Mini 4 and SIM card (latter supplied by EEAST) with the Visionable App downloaded (see Figure 1 below) or an iPhone 7 with the dedicated telephone number to contact the Stroke Consultant. Telemedicine training was undertaken as part of the Study Day and all iPads tested and working and the Project Manager's contact details shared. The paramedics are texted at the beginning of each week to inform them of which Stroke Consultant was available to them for advice.

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[1] https://www.eahsn.org/news/2017/07/digital-pioneers/

[2] https://visionable.com/visionable-at-work/virtual-stroke-diagnosis-and-treatment

The Stroke Consultants use the stroke telemedicine carts to connect with the paramedics - their Desktop PCs within the hospital Trust run their software, but both PCs would appear to be older and slow to load, therefore the telemedicine carts are more easily accessible on the Stroke Unit and in ED.

We also trained an additional 12 paramedics who were to be supported by 3 Stroke Consultants at Norfolk & Norwich Hospital - but this cohort of the project never became established due to delays related to information governance requirements at the hospital Trust.

The paramedics were also provided with a Patient Feedback Form - available as a paper form and via a QR link for online feedback to gain the vies of the patients involved in the project. Initial feedback has highlighted the proficiency of the paramedics and all reviews received so far have been very positive - many patients very pleased to not have to attend ED!

Challenges

There were a number of challenges to the project – and whilst the initial feasibility study did not achieve the anticipated number of patients, there was some clearly positive outcomes from this study, addressed later in this Case Study.

- **Lack of paramedics with telemedicine access** – one of the key issues that became immediately evident was that we did not have enough paramedics with

telemedicine access available to assess the potential 50 patients. 12 paramedics over a wide area – given their varying shift patterns, sickness and that 4 of the paramedics were based on the same vehicle – resulted in a small number of stroke patients being reached.

- **Matching resources** – combined with the small number of paramedics, the ambulance service was not able to direct these paramedics to stroke patients. There was no apparent simple solution for the call handlers to be able to ensure that potential stroke mimic patients contacting the ambulance service to the 'stroke paramedics'. Despite many attempts and requests to address this with the relevant Area Clinical Leads, this did not appear to translate well in practice.

- **Ambulance service communication & support** – the paramedics and their Clinical Managers involved with the project were excellent and very helpful, but there did appear to be a lack of awareness and engagement within the ambulance Trust itself.

During this time, the Stroke Consultants were still reporting that many stroke mimics were being referred to the ED, the relatively small number of 12 paramedics will clearly have little impact on these figures and it has become obvious relatively quickly that we needed to further extend the project and recruit further paramedics.

Second Phase

At the start the start of the COVID-19 pandemic, we were contacted by the EEAST Medical Director, Dr Tom Davies, who was very keen to have this project rolled out across the region as soon as possible, to help reduce the number of ED attendances, and for more paramedics to have access to the telemedicine software.

The plan was therefore to deliver the project using Visionable's Online Clinic application, which is accessible via any device and therefore more suitable to this project. This would be accessible via the EEAST website for any appropriate clinicians' to access.

For this phase of the Project, clinicians with the autonomy to leave patients at home, will be linking in with the Stroke Consultants at Ipswich, Norfolk & Norwich and QEH Hospitals, with a plan to implement this with our other Partner hospitals across the region.

EEAST engagement has been much improved in this second phase and we had a Project Lead appointed and had regular Teams meetings with this Lead and EEAST's Head of Projects and Programmes.

We plan to start the second phase of the project on Monday 28th September 2020 over a six month period.

- A recent publication by the Oxford AHSN highlighted the need for pre-hospital links with Stroke Consultants, suggesting Trusts *"consider enhanced pre-hospital communication with stroke consultants to reduce unnecessary conveyance to hospitals for patients with a stroke mimic or TIA"* (2020: 10)

Current Outcomes

The feasibility project's data below covers the period of 14th November 2018 – 25th January 2020.

Initial Diagnosis	No.	%	Outcome
Migraine (with aura/hemiplegia)	7	46.6%	TIA Clinic/ ED then home
Syncope/ TIA	4	26.6%	Other
Stroke & chest infection	1	6.6%	Home
Dizziness & unsteadiness	1	6.6%	Stroke Unit
Bell's Palsy	1	6.6%	GP
? Cortical stroke	1	6.6%	GP
TOTAL	**15**	100%	

Teleconsultation Calls

The median teleconsultation length was 37 minutes. We only experienced technical issues with connectivity on one occasion – and the patient very kindly let the paramedics use their WiFi network. This is using the current App approach which we estimate that this will be less of an issue as the project develops.

Patient Feedback

1. "I was treated with great care & speed. Once at the hospital I was treated immediately and admitted to Shotley Ward"
2. "Very helpful visit - offered me reassurance. Felt much more relaxed after their help. The paramedic explained very fully (Issues with iPad - used telephone)"
3. "I was very impressed with how quick everything was, the paramedics were absolutely fantastic"
4. "Excellent piece of kit - saved time for all concerned - very impressed"
5. "I think this is a very good idea, it saves time for the consultant and better for the patient. The ambulance crew were extremely helpful"

Summary

This is an innovative project that has attracted wider national interest with a clear need for the use of technology enhanced care to support the enhanced virtual triage of stroke mimic patients. Anecdotally the App is easy to use and the patient response has been very positive, with a 99% ED admission avoidance to date.

Some barriers have been overcome - some initial challenges from EEAST IT Directorate, linked to their current internal workload, which has been overcome with additional support from the telemedicine company. Additional finances have been provided by the Eastern AHSN, for which we are very grateful, in supporting backfill costs for the paramedic's release for the Study Day.

We have had very positive support from our Partnership hospitals and hope to increase this project firther to include all seven hospitals.

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