Mechanical thrombectomy and the ‘weekend effect’: does admission time influence outcomes?

Authors: Jake Weddell, Girish Muddegowda, Indira Natarajan, Sanjeev Nayak, Changez Jadun, Zafar Hashim, Phillip Ferdinand, Ranjan Sanyal, Albin Augustine and Christine Roffe

Introduction

In acute ischaemic stroke, ‘time is brain’, with 1.9 million neurones lost for every minute of untreated ischaemia, leading to death or disability. Recanalisation through mechanical thrombectomy has been shown to greatly improve outcomes in patients with large vessel occlusion. In the UK, few centres offer a 24/7 or out-of-hours thrombectomy service; however, many centres are planning on increasing their operating hours. For many conditions, there is strong evidence that treatment outside normal working hours results in poorer outcomes. This ‘weekend effect’ impacts the outcomes for many conditions, including stroke; however conflicting evidence exists for its impact on mechanical thrombectomy patients. In this study we report the effect of admission timing on mechanical thrombectomy outcomes at a 24/7 comprehensive stroke centre.

Methods

Patients were identified through a prospectively entered database of all mechanical thrombectomies performed at the Royal Stoke University Hospital. Data extracted included: age, National Institutes of Health Stroke Scale (NIHSS) scores, risk factors, pathway timings, complications and modified Rankin Scale (mRS) scores at 3 months. All thrombectomies performed between May 2009 and June 2019 were identified, of which 493 had complete data available and were therefore included in the study. In-hours admissions were defined as between 08:00–17:00 on Monday to Friday, any patients presenting outside this time window were classed as an out-of-hours admission. Statistical analysis was performed using Mann–Whitney U test and chi-squared test where appropriate.

Results

There were 210 in-hour thrombectomies and 283 out-of-hour thrombectomies performed in the time period analysed. Demographics of the two groups differed significantly with regards to age (in-hours median 71, interquartile range (IQR) 61–77; out-of-hours median 68, IQR 57–76; p = 0.01) and presence of hypertension (in-hours 47% vs out-of-hours 56%; p = 0.03). Door-to-groin times were significantly longer in the out-of-hours group (134 minutes vs 110 minutes; p = 0.02). There were no significant differences in short-term outcomes, including symptomatic intracranial haemorrhage (sICH) identified (in hours 6% vs out of hours 8%; p = 0.25). Finally, there were no significant differences in long-term outcomes including rate of functional independence at 90 days (in hours 51% vs 47%; p = 0.94) and death at 90 days (in hours 17% vs out of hours 20%; p = 0.28).

Conclusion

Patients presenting out of hours represented a different stroke population to those presenting in hours. Key pathway measures such as door to groin puncture were significantly longer in the out-of-hours period. However, these differences did not translate into any difference in short- or long-term outcomes. In conclusion we have demonstrated two key points. Firstly, that it is possible to provide a 24/7 mechanical thrombectomy service in the UK safely and effectively, and secondly, that there is no discernible ‘weekend effect’ in terms of short- and long-term outcomes post-mechanical thrombectomy.

Conflicts of interest

None declared.

References