



Title	What Is the Best Imaging Strategy for Acute Stroke?
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Aim

To determine the best imaging strategy for stroke.

Conclusions and results

It is impossible to differentiate infarct from hemorrhage by clinical examination. CT is sensitive and specific for hemorrhage within the first *8 days of stroke only*. Suboptimal scanning used in epidemiology studies suggests that the frequency of PICH, as a cause of mild stroke, has been underestimated. Patients taking aspirin at the time of stroke are more likely to have a PICH as the cause of stroke than patients not on aspirin. There was no evidence that a few doses of aspirin given inadvertently to patients with acute PICH significantly increased the odds of death. There were no reliable data on the effect of antithrombotic treatment on functional outcome or given long term after PICH. Of 232 patients with mild stroke, 3% had a PICH and 15% had hemorrhagic transformation of an infarct. A specific MR sequence is required to identify prior PICH reliably. CT scanners were distributed unevenly in Scotland. 65% provide CT within 48 hours of stroke and 100% within 7 days for hospital-admitted patients. Access out of hours was variable and poor for outpatients. The average cost of a CT brain scan for stroke in the NHS in Scotland was £30.23 to £89.56 during working hours and £55.05 to £173.46 out of hours. Average length of stay was greatest for severe strokes and those who survived in a dependent state. For a cohort of 1,000 patients aged 70 to 74 years, the policy "scan all strokes within 48 hours", cost £10,279,728 and achieved 1,982.3 QALYs. The most cost effective strategy was "scan all immediately" (£9,993,676 and 1,982.4 QALYs). The least cost effective was "scan patients on anticoagulants, in a life threatening condition immediately and the rest within 14 days" (£12,592,666 and 1,931.8 QALYs). "Scan no patients" reduced QALYs (1,904.2) at increased cost (£10,544,000).

Recommendations

Strategies in which most stroke patients were scanned immediately cost least and achieved the most QALYs,

as the cost of CT was swamped by the cost of inpatient care. Increasing independent survival by even a small proportion through early use of aspirin in most ischemic stroke cases (and avoiding inappropriate antithrombotic treatment in those with hemorrhagic stroke) reduced costs and increased QALYs.

Methods

We developed a decision analysis model to represent the pathway of care in acute stroke using "scan all patients within 48 hours" as the comparator against which to cost 12 alternative scan strategies. See monograph for sources of data.

Further research/reviews required

Future research should be directed at: the proportions of patients with stroke and recurrent stroke due to infarct or hemorrhage by age and severity of stroke; whether secondary prevention of ischemic events with antithrombotic treatment is safe and effective in patients with prior PICH, and if so what degree of ischemic vascular risk is required to outweigh any adverse effect of increased hemorrhagic events with aspirin; and the accuracy of imaging.