Emergent aneurysm treatment compared with treatment on neurological improvement in patients with ruptured poor-grade aneurysmal subarachnoid haemorrhage: the TOPSAT2 RCT

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Plain English summary

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Plain English summary

Subarachnoid haemorrhage is a form of stroke where there is a bleed on the surface of the brain, usually caused by weaknesses in brain blood vessels called aneurysms. Unlike most strokes, it mainly affects younger people – typically those aged 40–60 years. Recovery largely depends on the severity of the brain injury caused by the bleed. The severity is assessed by the World Federation of Neurosurgical Societies grading system. This grading system largely relies on assessment of the level of consciousnessness using the clinically and universally used Glasgow Coma Scale. Patients with World Federation of Neurosurgical Societies grades 1–3 usually achieve good recovery (alive and independent), but patients with grades 4 or 5 often have a bad outcome (death or severe disability).

World Federation of Neurosurgical Societies grade 1–3 patients are treated quickly (as soon as is practicable after admission to a neurosciences centre) and mainly by aneurysm coiling when this is available and the aneurysm is suitable, based on evidence from trials. Coiling is a method where a very thin tube is fed inside blood vessels into the aneurysm in the brain and the aneurysm is blocked off by platinum wire coils placed through that tube. In the past, grade 4–5 subarachnoid haemorrhage patients tended to be treated only after their condition had improved, typically to a better grade (1–3). With the introduction of coiling, these patients are increasingly being treated sooner, but we do not know whether it is better to treat quickly or wait until the patient recovers (to a better level of consciousnessness).

In the treatment of poor-grade subarachnoid haemorrhage trial 2 (TOPSAT2), we randomly assigned patients with grade 4–5 subarachnoid haemorrhages to either early treatment, irrespective of condition, or treatment when their condition improved, irrespective of when that happened (so it was treat on improvement, not delayed treatment). Unfortunately, either many patients were not eligible for the trial or patients' doctors were uncertain of which approach was better, so were reluctant to enrol them in the trial, mostly choosing to treat them early. Therefore, the trial had to stop early because recruitment would have taken too long.

Twenty-three patients out of a target of 346 were randomised over a 25-month period. The average time from bleed to treatment was 26 hours in the early-treatment group and 163 hours in the treat on improvement group. The small number of patients enrolled limits the conclusions that can be drawn. No statistically significant differences were identified between the groups in rates of death or outcome (alive and independent). However, the data we obtained within the robust randomised controlled trial design used in TOPSAT2 have, as an offshoot, usefully demonstrated that timelines for both trial randomisation and treatment of aneurysmal subarachnoid haemorrhage patients within neuroscience centres have reduced (improved) in the UK since earlier subarachnoid haemorrhage trials (international subarachnoid aneurysm trial, 1994–2002).

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This report

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