Evidence Based Medicine

The international surgical trial in intracerebral haemorrhage (STICH) — what are its implications in a resource limited health system like Pakistan?

Maria Khan, Ayeesha Kamran Kamal
Stroke Service and Vascular Fellowship Programme, Aga Khan University Hospital, Stadium Road, Karachi.

Why is the study important?

Spontaneous supratentorial intracerebral hemorrhage accounts for 20% of all strokes and carries up to 40% mortality. Since hypertension affects about a quarter of Pakistanis above age 45, combined with inadequate control, it is expected that hypertensive ICH constitutes an important proportion of the overall burden of stroke in Pakistan and indeed the developing world.

Despite such a huge disease burden, it was not clear whether surgical treatment or medical treatment is superior in reducing disability or ensuring survival. Theoretically there are several reasons why clot removal should help; it would decrease the intracranial pressure and improve perilesional perfusion. There had been 9 trials evaluating this question before STITCH, and the results have been mixed. The investigators for STITCH felt that now with improved surgical techniques, neuro-anaethesia and post operative care; they might be able to prove that surgery is beneficial for spontaneous supratentorial hemorrhage.

Who were the participants?

1033 patients from 107 centers in 27 countries across the world were recruited in the trial over an eight year period. Most participants were from European countries. However there were centers in India as well, from where 85 patients were recruited. Hence there was some South Asian representation in this sample. China and Japan also contributed some twenty odd patients.

Patients were eligible if they had a spontaneous supratentorial intracerebral hemorrhage that had arisen within 72 hours and the treating neurosurgeon was not sure of the benefits of either treatment. Patients were excluded if their bleed was secondary to an aneurysm or AVM, or if they had brainstem extension.

What was the intervention?

Telephone randomization service was used. Within 24 hours of randomization, people randomized to surgical arm underwent hematoma evacuation by the method of choice of the responsible neurosurgeon. Those randomized to medical arm, received the best available medical care, and if at a later point it was deemed important to evacuate the hematoma, they also underwent surgery.

What was the outcome?

Outcome assessment at six months was blinded. The surviving patients or their care givers were sent structured questionnaires which had questions regarding the Glasgow outcome scale, the Barthel Index and Modified Rankin Scale.

All analysis was done on an intention to treat basis.

The outcome assessment was dichotomized based on median prognostic score at randomization into good and poor prognoses.

503 patients were randomized to early surgery and 530 to initial conservative treatment. The groups were well matched in terms of age, gender, pre ICH functional status, medical comorbids, site and volume of hematoma and its depth from the surface. In the surgical arm 26 patients and in the medical arm 25 patients lost to follow up. A further 9 in the surgical arm and 8 in the medical arm were excluded from all but the survival analysis as they did not fill out the outcome assessment forms at six months.

The mortality rate at 6 months for the early surgery group was 36% compared with 37% for the initial conservative treatment group (odds ratio 0·95 [0·73-1·23], p=0·707); Survival during the first 6 months did not significantly differ between the two groups (log-rank test, p=0·678).

With the prognosis based dichotomy of the extended Glasgow outcome scale, the modified Rankin scale and the Barthel index, there were no significant differences between the surgical and initial conservative arms (p=0.414, p=0.116 and p=0.144 respectively) at six months.

Subgroup analysis had similar non significant findings. The only subgroup to show heterogeneity of treatment response was depth of hematoma from cortical surface. A favorable outcome from early surgery was more likely if the hematoma was 1 cm or less from the cortical surface (absolute benefit 8%; 0-15); interaction between depth from cortical surface and treatment was significant (p=0·02).

What were the conclusions?

The authors conclude that the outcomes in patients with spontaneous supratentorial intracerebral hemorrhage do not differ significantly whether they undergo early surgery or initial conservative treatment. The only subgroup to show favorable outcome with surgery were patients with hematomas 1 cm or less from the cortical surface. Therefore the role of surgery continues to be uncertain except in a small minority of patients.

What does stitch teach us?

This is a landmark trial as randomized trials in surgical patients with severe neurological dysfunction are difficult. Additionally, patients were "real world", interventions were not "technically demanding". The trial is also quite generalizable as it had patients from 27 countries across five continents.

Pakistan is a developing country and the burden on the health system is tremendous. It is important to know that costly surgical intervention has no benefit on mortality and functional outcome in patients with spontaneous hypertensive intracerebral hemorrhage.

Recommended Reading

1. Mendelow AD, Gregson BA, Fernandes HM et al. Early surgery versus initial conservative treatment in patients with spontaneous supratentorial intracerebral haematomas in the International Surgical Trial in Intracerebral Haemorrhage (STICH): a randomised trial. Lancet 2005; 365: 387-97.
2. Kamal AK, Itrat A, Murtaza M, Khan M et al. The burden of stroke and transient ischemic attack in Pakistan: a community-based prevalence study. BMC Neurol; 9:58.
3. Farooq MU, Majid A, Reeves MJ, Birbeck GL. The epidemiology of stroke in Pakistan: past, present, and future. . Int J Stroke 2009; 4: 381-9.
4. Sessa M. Intracerebral hemorrhage and hypertension. Neurol Sci 2008; 29 Suppl 2: S258-9.