

My patient has had an intracerebral haemorrhage — How do I best control his blood pressure?

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Why is this study important and noteworthy?

Acute intracerebral haemorrhage is the least treatable form of stroke, with the prognosis highly dependent on the volume and growth of the underlying haematoma. Blood pressure often reaches high levels after an intracerebral haemorrhage and this elevated pressure is considered a predictor of outcome. While studies have previously established the benefit of lowering blood pressure in intracerebral haemorrhage, the safety and efficiency of acutely lowering blood pressure has not been established. This study was conducted to cover this gap in knowledge. INTERACT, which was conducted as a pilot for this study, showed encouraging results. This is the main-phase study on a much bigger sample.

Who were the participants?

A total of 2839 participants were enrolled at 144 hospitals in 21 countries. These were patients who presented with intracerebral haemorrhage as confirmed on a CT or MRI.

Exclusion criteria included structural cerebral causes for the intracerebral haemorrhage, massive haematoma with a poor prognosis, participants in a deep coma (defined as a score of 3 to 5 on the Glasgow Coma Scale [GCS]) or an early surgery to evacuate the haematoma.

What was the intervention?

Patients were randomized into two groups. In the intervention arm, patients who had systolic blood pressures between 150mm Hg and 220 mm Hg were given antihypertensive therapy within 6 hours of onset of stroke with a goal systolic pressure of ≤ 140 mm Hg within 1 hour of initiation of therapy. This pressure was to be maintained for the next 7 days. Any patient with a definite indication for or contraindication to blood-pressure-lowering treatment was excluded from the intervention as well as any patient in whom therapy could not be

commenced within 6 hours.

In the control group, patients were subjected to therapy according to standard guidelines. This involved administration of blood-pressure lowering treatment to patients if their systolic blood pressure was higher than 180 mm Hg.

The choices of blood pressure lowering agents were at the physician's discretion. In addition to the above, patients in both arms were to receive oral antihypertensive or oral nitrates by 7 days or at discharge, whichever occurred earlier.

What was the primary outcome measure?

The primary outcome measure for the study was the proportion of participants with a poor outcome, defined as death or major disability. Major disability was defined as a score of 3 to 5 on the modified Rankin scale 90 days after randomization.

What were the results?

In all 719 (52.0%) out of 1382 participants in the intervention group had death or disability as the major outcome as compared with 785 (55.6%) out of 1412 participants in the standard-treatment group (odds ratio with intensive treatment, 0.87; 95% confidence interval [CI], 0.75 to 1.01; $P < 0.06$).

Ordinal analysis showed a significant favourable shift in the distribution of scores on the modified Rankin scale with intensive blood-pressure-lowering treatment (pooled odds ratio for shift to higher modified Rankin score, 0.87; 95% CI, 0.77 to 1.00; $P < 0.04$).

What were the conclusions?

Intensive lowering of blood pressure did not significantly lower death or major disability. At the same time, functional outcome as assessed by the modified Rankin scale and quality of life as assessed by EQ-5D showed improvement for participants in the intervention group.

How does this impact our clinical practice?

There is very little information on how to acutely

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handle blood pressure after intracerebral ICH. Since this is proportionately more common in Pakistan (30% of all strokes as compared to 17% in Western data), this study is of direct importance to our regional practice.

The study most importantly suggests that it is safe to lower blood pressure intensively in the case of ICH. Although the findings do not statistically prove major outcome benefit, there was a lower proportion of major outcomes (52.0% as compared to 55.6%) in the

intervention arm. At the same time functional outcomes were reported to be better along with quality of life 3 months after the index event.

Recommended Reading

1. Anderson CS, Huang Y, Wang JG, Arima H, Neal B, Peng B et al. Intensive blood pressure reduction in acute cerebral haemorrhage trial (INTERACT): a randomised pilot trial. *Lancet Neurol* 2008; 7: 391-9.
2. Anderson CS, Heeley E, Huang Y, Wang J, Stapf C, Delcourt C, Rapid blood-pressure lowering in patients with acute intracerebral hemorrhage. *N Engl J Med* 2013; 368: 2355-65.