

RESEARCH NEWS

Intensive blood-pressure regulation in patients with acute cerebral hemorrhage: the lower the better?

B.A. de Weijer

Academic Medical Center, Amsterdam, the Netherlands

Correspondence

B. de Weijer - b.a.deweijer@amc.uva.nl

Keywords - blood pressure, acute cerebral hemorrhage**Article**

Intensive blood-pressure lowering in patients with acute cerebral hemorrhage. Published in the New England Journal of Medicine, September 2016^[1]

Why was this research done?

Spontaneous non-traumatic intracerebral haemorrhage is commonly followed by an acute hypertensive response, which is associated with haematoma expansion leading to disability or death. Previous research has shown that guideline recommended (<180 mmHg) compared with intensive reduction (<140 mmHg) of systolic blood pressure in patients with a systolic blood pressure of 150 to 220 mmHg within six hours of onset of symptoms of cerebral haemorrhage does not lead to a significant reduction in disability or death. However, very early and more aggressive blood pressure reduction in these patients might influence these negative outcomes. Therefore the authors studied superiority of intensive reduction of systolic blood pressure to standard reduction in patients with acute cerebral haemorrhage.

What was the research question?

Whether rapid intensive lowering of systolic blood pressure in patients with spontaneous supratentorial intracerebral haemorrhage leads to a better clinical outcome compared with standard care.

How was this investigated?

In this multicentre, randomised two-group, open-label trial, 1000 patients were enrolled, 500 patients were assigned to the standard treatment group and 500 to the intensive treatment group. The authors compared intensive systolic blood pressure lowering (110 to 139 mmHg) with standard reduction (140 to 179 mmHg) within 4.5 hours after symptom onset. The primary outcome was death or disability at three months after randomisation. Secondary outcomes were quality of life and

number of participants with haematoma expansion of 33% or more within 24 hours. Patients were eligible if they had a Glasgow Coma Scale (GCS) score of 5 or more, an intraparenchymal haematoma of less than 60 cm³ on computed tomographic (CT) scan and one or more readings of systolic blood pressure of 180 mmHg between onset of symptoms and initiation of intravenous antihypertensive treatment. Nicardipine was used a first-line antihypertensive treatment agent according to protocol, labetalol was assigned as second agent.

The haemorrhage was evaluated at baseline and 24 hours after treatment initiation. Follow-up data were collected after three months during in-person clinical evaluation using the modified Rankin scale, the European Quality of Life-5 Dimensions (EQ-5D) questionnaire, and physical and neurological examination.

Main findings

The mean interval between onset of symptoms and randomisation was similar for both groups (intensive treatment group 182.2±57.2 minutes versus standard treatment group 184.7±56.7 minutes). The mean minimum systolic blood pressure during the first two hours was 128.9±16 mmHg in the intensive treatment group and 141.1±14.8 mmHg in the standard treatment group. The primary outcome death or disability was observed in 38.7% (186 of 481) of the participants in the intensive treatment group and 37.7% (181 of 480) in the standard treatment group (relative risk 1.04; 95% confidence interval 0.85 to 1.27; analysis was adjusted for age, initial GCS score, and presence or absence of intraventricular haemorrhage). The secondary outcomes, EQ-5D and haematoma expansion, did not differ significantly between the two groups. Serious adverse events within 72 hours that were considered to be related to the treatment occurred in 1.6% of the intensive-treatment group versus 1.2% of the standard treatment group. The renal adverse events reported within seven days after randomisation were significantly higher in the intensive treatment group (9.0% versus 4.0%, p=0.002).

Main conclusion

Acute intensive blood lowering in patients with intracerebral haemorrhage does not result in a lower rate of death or disability than the standard reduction.

Consequences for daily practice

The current recommendation for the treatment of hypertension in case of acute spontaneous intracerebral haemorrhage, dating from 2007,^[2] was to maintain a systolic blood pressure ≤ 180 mmHg and/or mean arterial pressure < 130 mmHg. Since then, several trials have been initiated to study intensive blood pressure reduction.^[3,4] None of these studies showed a significant reduction in the rate of the primary outcome of death or severe disability. On the contrary, several studies have shown a poor clinical outcome in patients presenting with a blood pressure > 210 mmHg in the acute phase following spontaneous intracerebral haemorrhage.^[5] The initial hypertensive response after intracranial haemorrhage is assumed to be a physiological response to obtain cerebral perfusion. Lowering blood pressure intensively could lead to decreased brain perfusion resulting in neurological damage. This was not objectivated in the current trial. However, significantly more renal adverse events were found in the intensive treated population, indicating intensive treatment might do more harm compared with standard treatment. The recent studies showed

that reducing the blood pressure below the current target of < 180 mmHg does not improve outcome. It still remains unclear whether accepting a systole of 180-210 mmHg is safe and what the optimal timing of initiation of treatment is. Therefore, in the absence of more evidence, the advice to treat patients presenting with a blood pressure > 180 mmHg within one hour after acute spontaneous haemorrhage according to the standard treatment protocol remains the recommendation.

Disclosures

The authors declares no conflict of interest. No funding or financial support was received.

References

1. Qureshi AI, Yuko YP, Palesch D, et al. Intensive blood-pressure lowering in patients with acute cerebral hemorrhage. *N Engl J Med*. 2016;375:1033-43.
2. Broderick J, Connolly S, Feldmann E, et al. Guidelines for the management of spontaneous intracerebral hemorrhage in adults: 2007 update: a guideline from the American Heart Association/American Stroke Council, High Blood Pressure Research Council, and the Quality of Care and Outcomes in Research Interdisciplinary Working Group. *Stroke*. 2007;38:2001-23.
3. Anderson CS, Heeley E, Huang Y, et al. Rapid blood-pressure lowering in patients with acute intracerebral hemorrhage. *N Engl J Med*. 2013;368:2355-65.
4. Qureshi AI, Palesch YY. Antihypertensive Treatment of Acute Cerebral Hemorrhage (ATACH) II: design, methods, and rationale. *Neurocrit Care*. 2011;15:559-76.
5. Willmot M, Leonardi-Bee J, Bath PM. High blood pressure in acute stroke and subsequent outcome: a systematic review. *Hypertension*. 2004;43:18-24.

NVCI

Netherlands Journal of Critical Care
Bi-monthly journal of the Dutch Society of Intensive Care

Call for authors

For online submission of your manuscript and more information please visit us at www.njcc.nl

www.njcc.nl