ORIGINAL ARTICLE

Intensive Blood-Pressure Lowering in Patients with Acute Cerebral Hemorrhage

Adnan I. Qureshi, M.D., Yuko Y. Palesch, Ph.D., William G. Barsan, M.D., Daniel F. Hanley, M.D., Chung Y. Hsu, M.D., Renee L. Martin, Ph.D., Claudia S. Moy, Ph.D., Robert Silbergleit, M.D., Thorsten Steiner, M.D., Jose I. Suarez, M.D., Kazunori Toyoda, M.D., Ph.D., Yongjun Wang, M.D., Haruko Yamamoto, M.D., Ph.D., and Byung-Woo Yoon, M.D., Ph.D., for the ATACH-2 Trial Investigators and the Neurological Emergency Treatment Trials Network*

ABSTRACT

BACKGROUND

Limited data are available to guide the choice of a target for the systolic blood-pressure level when treating acute hypertensive response in patients with intracerebral hemorrhage.

METHODS

We randomly assigned eligible participants with intracerebral hemorrhage (volume, <60 cm^3) and a Glasgow Coma Scale (GCS) score of 5 or more (on a scale from 3 to 15, with lower scores indicating worse condition) to a systolic blood-pressure target of 110 to 139 mm Hg (intensive treatment) or a target of 140 to 179 mm Hg (standard treatment) in order to test the superiority of intensive reduction of systolic blood pressure to standard reduction; intravenous nicardipine to lower blood pressure was administered within 4.5 hours after symptom onset. The primary outcome was death or disability (modified Rankin scale score of 4 to 6, on a scale ranging from 0 [no symptoms] to 6 [death]) at 3 months after randomization, as ascertained by an investigator who was unaware of the treatment assignments.

RESULTS

Among 1000 participants with a mean (±SD) systolic blood pressure of 200.6±27.0 mm Hg at baseline, 500 were assigned to intensive treatment and 500 to standard treatment. The mean age of the patients was 61.9 years, and 56.2% were Asian. Enrollment was stopped because of futility after a prespecified interim analysis. The primary outcome of death or disability was observed in 38.7% of the participants (186 of 481) in the intensive-treatment group and in 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 hemorrhage). Serious adverse events occurring within 72 hours after randomization that were considered by the site investigator to be related to treatment were reported in 1.6% of the patients in the intensive-treatment group and in 1.2% of those in the standard-treatment group. The rate of renal adverse events within 7 days after randomization was significantly higher in the intensive-treatment group than in the standard-treatment group (9.0% vs. 4.0%, P=0.002).

CONCLUSIONS

The treatment of participants with intracerebral hemorrhage to achieve a target systolic blood pressure of 110 to 139 mm Hg did not result in a lower rate of death or disability than standard reduction to a target of 140 to 179 mm Hg. (Funded by the National Institute of Neurological Disorders and Stroke and the National Cerebral and Cardiovascular Center; ATACH-2 ClinicalTrials.gov number, NCT01176565.)

The authors' affiliations are listed in Appendix. Address reprint request Dr. Qureshi at the Zeenat Qureshi St Research Center, University of Minne 925 Delaware St. SE, Minneapolis, 55455, or at qureshai@gmail.com.

*A complete list of the investigators sites participating in the Antihyper sive Treatment of Acute Cerebral He rhage II (ATACH-2) trial is provide the Supplementary Appendix, avail at NEJM.org.

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