

American guidelines for the management of spontaneous intracerebral hemorrhage in adults: European perspective

Thorsten Steiner, Eric Jüttler

Department of Neurology, Heidelberg University, Heidelberg, Germany

Intracerebral hemorrhage (ICH) is one of the most devastating forms of stroke. From 35% to 52% of patients die within 1 month, 42–65% within one year of ICH. Of the survivors 80% remain dependent on every-day support with about 30% very severely disabled patients. As a result ICH not only has major consequences for the patients themselves and their caregivers, but also has an enormous socio-economic impact. In the European Union about 90,000 patients per year suffer from a new ICH. In Eastern European countries ICH is of special significance, because both, general stroke incidence rates and the proportion of ICH are particularly high.

ICH is still the least treatable form of stroke and a specific effective therapy is still lacking. In addition, the pathophysiological concept of ICH, which provides the basis for therapeutic interventions, is relatively poorly understood compared to ischemic stroke. In June 2007 the American Heart Association/American Stroke Association (AHA/ASA) published "Guidelines for the Management of Spontaneous Intracerebral Hemorrhage in Adults – 2007 Update" [1]. About one year earlier, in March 2006, the European Stroke Initiative (EUSI) had published their "Recommendations for the Management of Intracranial Haemorrhage – Part I: Spontaneous Intracerebral Haemorrhage" [2]. A detailed comparison of both recommendations can be found in [3]. In this editorial we highlight the major differences in recommendations concerning several important treatment aspects.

1. The treatment of increased blood pressure, which can be found in 46–56% of patients with acute ICH, is highly controversial. The reason behind the ongoing debate of aggressive, moderate or no lowering of the blood pressure in the acute phase of ICH is the discrepancy between the uncertainty of arterial hypertension being a predictor of early hematoma enlargement, increased mortality, and morbidity on the one hand, and the uncertainty of the presence of a perihe-

matomal area of critical hypoperfusion and the fear that blood pressure lowering may cause perilesional ischemia or global hypoperfusion in long-standing arterial hypertension on the other hand. This is reflected by largely different recommendations regarding upper and lower limits of blood pressure, trigger values to initiate treatment, and target values in national guidelines. American Heart Association/American Stroke Association recommendations differentiate between those patients with and those without elevated intracranial pressure (ICP) and recommend considering "aggressive reduction", when systolic blood pressure exceeds 200 mmHg or mean arterial pressure (MAP) exceeds 150 mmHg. In patients, in whom systolic blood pressure exceeds 180 mmHg or MAP exceeds 130 mmHg, and without evidence or suspicion of elevated ICP, "modest reduction" of blood pressure should be considered, targeting at 160/90 mmHg or a MAP of 110 mmHg. In patients, in which systolic blood pressure exceeds 180 mmHg or MAP exceeds 130 mmHg, and with evidence or suspicion of elevated ICP, monitoring of ICP and cerebral perfusion pressure (CPP = MAP – ICP) is recommended and blood pressure lowering should be adapted to maintain CPP >60–80 mmHg. The European Stroke Initiative recommendations use a completely different approach based on a history of hypertension: antihypertensive treatment in previously hypertensive patients should be initiated, when systolic blood pressure exceeds 180 mmHg or when diastolic blood pressure exceeds 105 mmHg targeting at 160–170/100 mmHg or a MAP of 120–125 mmHg. In patients without a history of hypertension trigger values are 160 mmHg systolic and/or 95 mmHg diastolic with target values of 150/90 mmHg or a MAP of 110 mmHg. In any case MAP should not be lowered by more than 20% of the baseline value. European Stroke Initiative also recommends adapting arterial blood pressure thresholds in patients with increased ICP to maintain a CPP of at least 60–70 mmHg. These recommendations might be changed in the future with respect to the just published results of INTERACT and ATACH. Both pilot trials further strengthen the assumptions that blood pressure lowering in the acute phase of ICH below systolic values of 140 mmHg may be safe.

2. Considering surgical hematoma evacuation AHA/ASA clearly states that standard craniotomy within 96 hours of ic-

Correspondence to:

Professor Thorsten Steiner, MD, PhD, Department of Neurology, Heidelberg University, Im Neuenheimer Feld 400, 69120 Heidelberg, Germany, phone: +49-6221-56-39096, fax: +49-6221-56-5837, e-mail: thorsten_steiner@med.uni-heidelberg.de

Received: December 21, 2007. Accepted in final form: January 8, 2008.

Declared conflict of interest: Prof. Steiner has received consulting and speaking fees from Novo Nordisk.

Pol Arch Med Wewn. 2008; 118 (4): 181–182

Copyright by Medycyna Praktyczna, Kraków 2008

tus is not recommended, especially in deep hematomas, but may be considered in patients with lobar hematomas, when they are superficial (<1 cm from surface). The European Stroke Initiative recommendations are almost identical, although EUSI more carefully states that, although there is currently no evidence for a general recommendation of surgery in patients with ICH, initial clinical observation is reasonable, but considering surgery in those patients who deteriorate in consciousness (GCS 12–9 to <9).

3. In oral anticoagulation therapy (OAT)-related ICH AHA/ASA recommendations ranks fresh frozen plasma of lower value compared to prothrombin complex, because of its longer infusion time and the risk associated with higher volumes to be applied for adequate replacement of clotting factors, and also lists factor IX-concentrates and recombinant factor VIIa (rFVIIa) as possible therapies, whereas EUSI does not comment on the use of different clotting factor replacement strategies.

The societies recommend basing the decision on whether and when to restart OAT after an OAT-ICH on the presumed risk of thromboembolic events and the risk of rebleeding. Antiplatelets are recommended in patients with low thromboembolic risk (e.g. atrial fibrillation with no prior stroke) and high risk of rebleeding (ICH with lobar location). Oral anticoagulants should be considered in patients with high risk for thromboembolic events (e.g. prosthetic valves) and lower risk bleeding recurrence (ICH located in the basal ganglia). American Heart Association/American Stroke Association recommends resuming OAT 7–10 days after the ictus, EUSI after 10–14 days.

Considering heparin-related ICH both societies recommend the use of protamine sulfate with a dose depending on the time between last heparin application and administration of protamine sulfate.

4. American Heart Association/American Stroke Association and EUSI both recommend considering low-dose subcutaneous unfractionated heparin or low molecular-weighted heparin for the prevention of deep venous thromboembolism. However, there are differences regarding the time when to start treatment: AHA/ASA recommends starting after 3–4 days, EUSI recommends starting after 24 hours.

Withdrawing life-sustaining support is the most common immediate cause of death in ICH. This delicate topic is only evaluated in the AHA/ASA recommendations.

5. In summary there is much overall agreement between AHA/ASA and EUSI recommendations concerning most aspects of treatment of spontaneous ICH, which is somewhat surprising in a field of stroke where there is little evidence by clinical trials and much is based on expert opinion. There are, however, large differences in the use of assessment criteria for evidence. Whereas EUSI criteria are comparatively strict, AHA/ASA criteria are much more flexible, i.e. AHA/ASA rates “general agreement” equivalent to “evidence” as class I evidence, and “expert opinion” as level C recommendation. In addition, in several aspects such as blood pressure treat-

ment or treatment of elevated ICP there are different conceptual approaches by the two societies. Some topics are not covered by both recommendations, i.e. EUSI includes the treatment of arteriovenous malformations, which is covered by AHA/ASA elsewhere [4], and the most important topic of withdrawal of therapy is only discussed by AHA/ASA. AHA/ASA announced to update these recommendations after 3 years. It would be very welcome EUSI and AHA/ASA could find a consensus to harmonize their assessment criteria to provide integrative recommendations in the future.

REFERENCES

1. Broderick J, Connolly S, Feldmann E, et al. Guidelines for the management of spontaneous intracerebral hemorrhage in adults. 2007 Update. *Circulation*. 2007; 116: e391-e413.
2. Steiner T, Kaste M, Forsting M, et al. Recommendations for the management of intracerebral hemorrhage – part I: spontaneous intracerebral hemorrhage. *Cerebrovasc Dis*. 2006; 22: 294-316.
3. Jüttler E, Steiner T. Treatment and prevention of spontaneous intracerebral hemorrhage: comparison of EUSI and AHA/ASA recommendations. *Expert Rev Neurother*. 2007; 7: 1401-1406.
4. Ogilvy CS, Stieg PE, Awad I, et al. Recommendations for the management of intracranial arteriovenous malformations. *Stroke*. 2001; 32: 1458-1471.