Letters to the Editor

Hemodilution in Ischemic Stroke

To the Editor:

Koller et al report on a positive clinical effect of hypervolemic hemodilution in ischemic stroke. However, their data cause doubts about the conclusions they draw. Baseline neurological scores in the two groups differ considerably, although without significance, in favor of the hemodiluted group. Since clinical evidence suggests an inverse correlation between clinical outcome and initial severity of ischemic deficits, this difference may render the comparison unreliable. Nevertheless, improvement in the hemodiluted group was 13 points (24%), whereas the control group improved by 10.8 points (23%). Thus there is no significant difference in favor of hypervolemic hemodilution, even after exclusion of dead patients from the analysis.

The Mathew score and its sub-scores obviously are not independent. The overall type 1 error can be greater than 0.05; therefore, Bonferroni's correction or another type of significance control for multiple tests is mandatory. The same argument has to be taken into account with repeated group comparisons at different time intervals. The curves of Figure 2 of Koller et al are based on a linear transformation of the individual scores. It is questionable, however, whether this method is really applicable because a relative change of improvement in a minimally affected patient has quite a different impact than the same relative change in a severely affected one.

Mortality among hemodiluted patients was higher than in the control group (five versus three patients). In one hemodiluted patient, "hypervolemia may have contributed to the death" (due to myocardial infarction). The Hemodilution in Stroke Study Group terminated its trial on hypervolemic hemodilution because of adverse effects, i.e., clinical deterioration under isovolemic hemodilution and increased mortality among hemodiluted patients with deep infarctions.4,5

In summary, the results presented allow only the following conclusions: the superiority of hypervolemic hemodilution has not been proved with a sufficient degree of certainty, and treatment-related increased mortality cannot be excluded due to the small sample size.

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References

Predicting Outcomes After Intracerebral Hemorrhage

To the Editor:

In a carefully performed prospective study, Daverat et al have generated predictive models of outcome after intracerebral hemorrhage. But the models could represent self-fulfilling prophecies, as commented on in a prior work by Tuhrim et al.2-3 Death may be a function of treatments, given or withheld, which in turn may be a function of age. What effects did surgical drainage of hematoma have on outcome, and were such surgeries more likely to be performed on younger than older patients? What proportion of patients had limitation of medical support, and did the proportion differ in younger versus older patients? Without such information, assessment of the predictive models is difficult.

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References

The following is in response:

To the Editor:

In our study,1 we prospectively analyzed outcome after intracerebral hemorrhage (ICH). Our approach was a very pragmatic one, attempting to generate initial predictive models on the day of the stroke. Death could certainly be a function of treatments, whether given or withheld, particularly surgical drainage. But our study was not an assessment of surgical treatment after ICH. The treatment given was the one supposed to be the best, i.e., surgical drainage in large hematomas with midline shift. The age of the patient was not a factor in such a surgical decision. In our sample, 31 of 166 patients (18.7%) initially underwent operation. The mean age of patients operated on was 62.1±7.2 years, whereas the mean age of patients not operated on was 60.6±10.7 years. The difference was not statistically significant (Student's t test=0.98, p=0.33). Eighteen patients (58%) with surgical drainage died versus 53 (39.3%) in the non-operated group, with a nonsignificant difference (x²=2.91, p=0.09). This could be explained because the decision for surgery was based on hemorrhage size, associated with midline shift, which are important predictors of mortality.

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Reference
1. Daverat P, Castel JP, Dartigues JF, Orogogozo JM: Death and functional outcome after spontaneous intracerebral hemor-
Predicting outcomes after intracerebral hemorrhage.

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