Letters to the Editor

Cost-Effective Outcome for Treating Poor-Grade SAH

To the Editor

Recently, Wilby et al published the results of a study on the costs and outcome of treating poor-grade subarachnoid hemorrhage (SAH) patients. Poor-grade SAH was defined as World Federation of Neurological Surgeons (WFNS) grades 4 and 5. The authors showed that aggressive management of these patients is clinically justified since a significant subset of patients can achieve favorable outcomes (defined as Glasgow Outcome Scale (GOS) scores 4 [moderate disability] and 5 [good]). Thus, although expensive with major demands on critical care resources, the treatment of these patients was found to be cost-effective overall.

We fully agree with the conclusion of the authors, but we would like to make some comments on the management protocol used in this study. After diagnosis of poor-grade SAH, patients in this study were sedated, ventilated, and transferred from the referring hospital to the referral neurosurgical unit. Fluid and electrolyte resuscitation was carried out, hydrocephalus was treated if necessary, but diagnostic angiography and treatment of the culprit aneurysm was postponed. After 24 hours sedation was reversed and a new neurological assessment was performed. Only patients with a Glasgow Motor Score (GMS) of at least 4 were selected for angiography. This means that almost half of the patients (47%) were managed conservatively, all of whom eventually died, and that probably most patients who subsequently proceeded to diagnosis and treatment of the aneurysm were in WFNS grade 4. We recently presented the results of a prospective study of the endovascular treatment of 11 patients with SAH WFNS grade 5 admitted during a 12-month period. Inclusion criteria were Glasgow Coma Score between 3 and 6 after resuscitation without improvement after ventriculostomy in case of hydrocephalus. All WFNS grade 5 patients were included in our study, unless brain stem reflexes were absent or an aneurysmal intracerebral hemorrhage mandated surgical evacuation. The treatment protocol consisted of early endovascular occlusion of the aneurysm followed by aggressive treatment of intracranial hypertension and prevention of vasospasm by routine hypertensive hypervolemic hemodilution therapy. Of these very poor-grade patients, 55% reached a favorable outcome (GOS score 4 or 5); the mortality rate was 18%. We believe that, although the number of patients in our study is small, these figures show that even patients with a GMS of less than 4 have a fair chance of experiencing favorable outcomes. Because no admission finding is a sufficient absolute predictor of outcome in patients with aneurysmal SAH, we suggest that treatment is not withheld from patients even in very poor neurological condition, unless brain stem reflexes are absent.

The other major difference between the treatment protocol of the study of Wilby et al and that followed in our own study is the 24-hour delay before further diagnosis and treatment is performed. In their study, 15% of the patients for whom surgery was planned died because of rebleeding. It is not clear how many patients suffered from rebleeding during the 24-hour observation period preceding neurological assessment. In some patients of this group, early rebleeding may have been the cause of persistent poor neurological condition. As the authors state in their conclusion, their study emphasizes the need to rapidly proceed to definitive therapy to preserve the viability of the already compromised brain. This optimal treatment includes early occlusion of the aneurysm to prevent rebleeding and to allow appropriate prevention of vasospasm by optimizing cerebral perfusion, as well as early treatment of hydrocephalus. This is confirmed in a surgical series of poor-grade patients. However, surgery in poor-grade patients is often difficult and has the risk of inflicting further damage to the already edematous and ischemic brain by retraction and manipulation of cerebral vessels. Therefore, the combination of early endovascular treatment causing minimal additional damage and aggressive intensive care for optimal cerebral perfusion may lead to the best results for these patients.

If early occlusion of the aneurysm and aggressive treatment is imperative in these patients, and if prediction of outcome at the moment of admission is impossible even in very poor-grade patients, we believe all patients with aneurysmal SAH should be treated, regardless of clinical grade. Treatment should not be denied to patients who might possibly have a favorable outcome, even though the costs are high due to the need of critical care and often prolonged hospital stays.

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References


Response

We are grateful to van Loon et al for the constructive points raised in response to this study.

The issue of coiling versus clipping aneurysms in poor-grade patients has been raised, and we agree that there is insufficient data to support one modality or the other. In their study of 11 poor-grade patients, van Loon et al report 6 patients achieving a favorable outcome post-coiling. Weir et al report a series of 27 poor-grade patients, of whom 5 (30%) achieve a good outcome post-coiling. This figure is comparable to our own surgical data. Bracard et al present a larger series of 80 poor-grade patients, of whom 42 (53%) achieve a favorable outcome post-coiling. Our own data included 5 patients treated by coiling (2 additional patients underwent an attempt at coiling but required surgery as a result of inability to perform the procedure). Of these 5, only one survived and this patient was severely disabled. These data sets are far too small to fashion generalized recommendations, but the wide variations in post-coiling outcome may reflect local operator expertise. No data are available for comparing the two treatment modalities since the only randomized trial to date achieved very low recruitment of poor-grade patients.

Acute treatment (ie, within 24 hours of rupture) pursues a sensible assumption that fewer patients will suffer rebleeding. We agree with the clinical instinct that poor-grade patients are more susceptible to repeat hemorrhage than patients with a smaller bleed. An observed rebleed rate of 15% would support this concern. Our current protocol-driven treatment paradigm was conceived from earlier work by this unit that incorporated a 24-hour period of resuscitation prior to clinical assessment. The rationale for this was partly to standardize the delays leading to cerebral angiography, and partly to allow a means of identifying patients who would have been falsely labeled as poor-grade. Our current data excluded 18 patients that were initially deemed poor-grade, but after 24 hours of resuscitation woke up to obey commands. Both the
series of patients presented by Bracard and Weir et al utilized a time-scale of 72 hours and still reported impressive outcomes. In spite of a rapid delivery of treatment, van Loon also reported a high re-bleed rate of 18%. Overall we agree that active treatment to secure the ruptured aneurysm should follow as soon as the decision to treat is made.

Finally, we were encouraged to see good outcomes of poor-grade patients reported by van Loon et al with a motor score <4. Our current data was similar to that of a previous prospective study reporting a significant improvement in outcome for patients able to mount a flexion response to pain compared with those who were not. None of the patients unable to mount a flexion response to pain after 24 hours of resuscitation and/or treatment of hydrocephalus survived. We continue to recommend that all poor-grade patients with intact brain stem reflexes should receive a period of intensive treatment and clinical reassessments prior to offering a definitive therapeutic maneuver.

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