Prognosis after Intracerebral Hemorrhage Is Uncertain, so Why Not Do Everything?

A key component of physician autonomy is our ability to give prognostic information to patients and families. But what happens when there are few scientific data to guide those predictions? This can be precarious and lead family to make life and death choices based on an ill-advised recommendation from a physician. Take the example of intracerebral hemorrhage (ICH). The literature is replete with studies suggesting high mortality following ICH, and prognostic scales that predict poor outcome based mostly on the size of the hematoma and how sleepy the patient is in the emergency department. For years, this led clinicians to make early withdrawal of care recommendations to family. Some researchers noted, however, that these ICH prognostic models were developed in patients who had early withdrawal of care.[1] This was a self-fulfilling prophecy; that is, if researchers developed a predictive model in patients whose care was withdrawn when they had large hematomas and were sleepy, then of course the model would show that hematoma size and Glasgow Coma Scale (GCS) score were predictive of ICH mortality. There is little doubt that patients with large hemorrhages and low GCS scores have a more difficult time recovering, but do we really know just what those chances are, especially if we do absolutely everything that a good neurocritical care unit can do?

This question led to several studies that demonstrated that withdrawal of care was a potent independent risk factor for ICH death even after controlling for the usual clinical predictors of bad ICH outcome.[2,3] A multicenter study of 109 subjects even demonstrated that care limitation deferral for at least the first 5 days, and aggressive neurocritical care, are associated with an absolute ICH mortality reduction of 30% compared with ICH-score prediction, and that one-third of subjects recover to better than moderate disability.[4]

In this issue of *Annals of Neurology*, Parry-Jones et al add to this growing literature by demonstrating a large survival benefit in ICH patients treated aggressively at a single hospital compared with outcomes reported in a national registry in the United Kingdom.[5] Their paper focuses on a "bundle" of treatments: reversal of coagulation status, referral to neurosurgery for some cases of ICH, blood pressure control and, admission to a neurological intensive care unit. The authors found a 6 to 12% absolute reduction in mortality during and after the intervention. Similar results were found in the quasiexperimental comparison to ICH patients in the UK registry. However, in a mediation analysis, a statistical way to estimate the role of a third variable in the association between the independent and dependent variables, none of the individual parts of the "bundle" was significantly associated with ICH mortality. The factor that mediated >50% and was significantly associated with a survival benefit was a reduction in early do-not-resuscitate orders. It seems that at the authors' hospital, invoking the "bundle" motivated clinicians to aggressively treat patients and not give up too early. As the authors note, this was not a clinical trial, and the "bundle" or its individual components cannot be endorsed based solely on this work. Each component of the "bundle" has its own evidence base and guideline comments.[6] The authors defend these particular interventions as "recommended" by the American Stroke Association ICH Guidelines; however, none of these is backed by class I, level of evidence A support, and some, such as referral to neurosurgery for hematomas >30ml, seem counter to statements from the guideline, such as, "For most patients with supratentorial ICH, the usefulness of surgery is not well established (Class IIb; Level of Evidence A)." The authors call for a cluster randomized clinical trial to test the "bundle." I would argue that a trial of delaying care withdrawal in ICH is really the issue to be further investigated. This study also did not collect information on functional outcome, a critical issue when examining ICH outcomes. Most would agree that survival at the expense of severe disability is not the goal.

Although it is true that there remains no specific treatment for ICH, it appears that outcome can vary tremendously based on the aggressiveness of care provided. An unfortunate outcome of physician autonomy is the difficulty we have in admitting uncertainty. Personally, with each passing year from residency, I feel less confident in making ICH clinical predictions, because the range of outcomes I have seen are so varied. We also tend to blame families for these capricious but life-determining decisions, although it is clear that we greatly influence these decisions. Therefore, if I have an ICH, I am not sure that I want the "bundle," but I am sure that I want a group of clinicians from the emergency department to the neurocritical care unit that will admit prognostic uncertainty,

and agree to aggressively treat me until the eventual outcome becomes more obvious.

Potential Conflicts of Interest

Nothing to report.

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