Emergency Treatments for Cerebral Hemorrhage

Intracerebral hemorrhage represents 15% of all strokes in the United States. It is also among the deadliest and most disabling forms of stroke. More than 40% of intracerebral hemorrhage patients die within 6 months or suffer devastating impairment.

Unfortunately, there are still no effective treatments—including surgery—for intracerebral hemorrhage or other forms of cerebral hemorrhage. Nevertheless, researchers at NewYork-Presbyterian Hospital say, studies are revealing opportunities for physicians to provide their patients with more than just supportive care.

"It's about pushing the envelope, finding better ways to treat the patients," said Stephan A. Mayer, MD. "We're looking for the cutting-edge protocols."

Dr. Mayer points to 2 ongoing trials exploring therapies to help patients cope with hemorrhage. Physicians at Columbia Presbyterian Medical Center are looking at recombinant factor VIIa as a possibility for arresting ongoing bleeding in intracerebral hemorrhage emergency room patients. In fact, Columbia Presbyterian Medical Center is part of a worldwide, multicenter trial testing the potential efficacy of recombinant human coagulation factor VIIa as an ultra-early hemostatic therapy for brain hemorrhage.

The preliminary dose escalation safety study, which treated 86 patients, offered "some indication of efficacy," said Dr. Mayer. Because of those results, the department has initiated a proof-of-concept trial with a target enrollment of 240 (it now has 186). That trial started in January.

Researchers at Columbia Presbyterian Medical Center are also exploring options for treating a subset of intracerebral hemorrhage patients: patients with intraventricular hemorrhage. Current procedure calls for inserting a ventricular catheter, noted Dr. Mayer, but physicians in the Neurological Intensive Care Unit recognize that "simply placing a catheter may be lifesaving, but otherwise doesn't appear to substantially benefit patients."

That's why, in conjunction with other centers, Dr. Mayer and his colleagues have been involved in a Phase II study enrolling 46 patients. The study's purpose is to evaluate the risks and benefits of a combination therapy: placing the catheter and "examining the potential efficacy of direct intraventricular thrombolytic therapy using tissue plasminogen activator." Because there is overwhelming evidence that clotted blood can be toxic, he added, "the hope is that by effectively lysing the clot and promoting its clearance, patients will suffer less damage due to reduced duration of contact with potential toxic blood elements (e.g., hemoglobin and thrombin)."

Only Preliminary Results

At NewYork Weill Cornell Medical Center, Igor Ougorets, MD, is currently using a treatment method that involves controlling hyperglycemia in his patients. "Some animal studies have indicated that hyperglycemia produces more neuro-injury in ischemic tissue," he explained. "The problem is that in all these areas all we have is preliminary data. We don't yet have the study that takes neuro-injured patients on a tightly controlled glucose level and compares them with a group that was not controlled to see if the glucose control changes the neurological outcome."

To date, according to Dr. Ougorets, treatment protocols for hemorrhage have not been based on the results of randomized trials but on the personal experience of neurologists in the field. All the researchers hope to change that, however, with their recent efforts.

Looking at Body Temperature

"Everyone agrees that overall temperature control has to be done," said Dr. Ougorets. "The problem is that we don't have clear-cut trials showing that it actually makes a difference in the outcome of our patients."

Another critical issue is the treatment of fever in patients with hemorrhagic stroke, according to Dr. Mayer. "Body temperature elevations are independently correlated with death and poor functional outcomes after both intracerebral hemorrhage and subarachnoid hemorrhage," he said, adding that conventional cooling blankets have been shown to be ineffective in reducing fever for these patients.

Dr. Mayer and his colleagues are currently conducting a clinical trial of the Medivance Arctic Sun Cooling System. The device seems to normalize body temperature more effectively than conventional cooling blankets. A hydrogel polymer provides enhanced contact with the patient's skin, allowing the water-circulating blankets to stick to the body and thus maintaining the cooling process more effectively than conventional means.

A head CT scan demonstrating a left-sided basal ganglia hemorrhage (left). A follow-up CT obtained after the patient further deteriorated (right) shows significant enlargement of the hematoma.

"Using regular cooling blankets, patients' body temperature remains over 101°F," said Dr. Mayer. "With this system, they go right down to normal, and stay there." The unexpected benefit of the system, he added, seems to be that "effective treatment of fever can produce clear and dramatic improvements in intracranial pressure levels, and in patients' levels of consciousness."

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