

The Evolution of Cerebrovascular Critical Care



The Society of Critical Care Medicine (SCCM) was founded in 1970. At that time, there was little to offer for the acute management of patients suffering from an acute cerebrovascular condition other than supportive care. Patients suffering from stroke were rarely found in the intensive care unit.

During the 1960s, 25% of stroke patients would die within 24 hours. Approximately 50% would die within 2 to 3 weeks. Even the ones who survived were also usually dead within 4 to 5 years.

Over the last fifty years, significant advancement has occurred in stroke care. Today, patients with acute cerebrovascular conditions are frequently admitted to the ICU for neurologic monitoring, observation and therapy.

However, even today, stroke is a leading cause of death and a leading cause of serious long-term disability. Mortality is usually high following haemorrhagic stroke than ischaemic stroke. Even though advancement in acute treatment for acute ischaemic stroke (AIS) has resulted in a decrease in mortality, it is still unchanged following intracerebral haemorrhage.

But during the last few years, there has been advancement in imaging and treatment protocols. Today, stroke victims are not the last to be seen in the emergency department. There is now a 'stroke code' that has resulted in more urgent attention to these patients in the emergency department and the prehospital arena. These patients are now considered a high priority for critical care admission and management.

During the 1970s, findings from the landmark Framingham study helped clinicians recognise that hypertension was an essential factor and that early detection and blood pressure control were imperative for stroke prevention. Data also demonstrated that diabetes also increased the risk of stroke and that nonvalvular atrial fibrillation is associated with a 5.6 fold increase in the risk of stroke.

Soon, the focus shifted from simply treating these patients after the event towards achieving an overall decrease in the prevalence of ischaemic and haemorrhagic stroke. Hypertension treatment for prevention remained the mainstay of therapy.

However, an important barrier that still remained was accurate diagnosis. Before clinicians had access to advanced imaging, it was unclear what proportion of strokes were ischaemic and haemorrhagic. There was a lack of accurate categorisation, and accurate diagnosis remained a challenge. During the 1970s, diagnosis of stroke was usually based on a detailed history and a neurologic examination. There was no CT scan at the time and pneumoencephalography and cerebral angiogram were used to assess intracranial pathology.

During the late 1970s and 1980s, digital subtraction angiography (DSA) evaluation of cervical and cerebral vasculature was developed. But it was CT and MRI that changed the world of diagnostic imaging and revolutionised stroke care.

With time, clinicians understood that in order to achieve optimal outcomes for stroke patients, it was important to manage the systemic complications that result from it. Today, neurologically trained critical care teams are well equipped to monitor and manage secondary injury from hypoperfusion, hypoxaemia, and hyperthermia. In addition, neurologic implications such as haemorrhagic transformation, rehaemorrhage, seizures and cerebral oedema are also managed better.

Many patients with AIS need critical care intervention. Patients who need invasive monitoring and surgical or endovascular intervention or those at high risk for decompensation with ICH or IVH or posterior fossa lesions require ICU admission. Those with strokes in multiple vascular territories are also at risk of developing brain swelling. But today, clinical and imaging findings can help identify patients who are more susceptible. Neurocritical care management following ICU is focused on targeting blood pressure and reversal of antithrombotic agents, but there are other surgical options for haematoma and IVH evacuation.

Overall, there has been significant advancement during the last 50 years. This stemmed from debunking common practices and the development of more reliant tools and strategies. Advancement in general critical care overall has had a significant impact on the management of patients with cerebrovascular disease. Today, critical care teams that cater to neurologically impaired patients evaluate new ventilator technologies and strategies and assess the impact of these strategies and techniques on brain physiology.

Inpatient stroke units have also developed that provide dedicated care to stroke patients. These units typically have multidisciplinary care teams that include neurologists, nurses and rehabilitation specialists. Patients who receive such focused care are more likely to be alive, independent and living at home within a year after their stroke.

However, challenges still remain. The SCCM is likely to lead the path to even better care in the future. It is expected that more rapid and less technologically heavy modalities will be used in the future that would help identify an ischaemic stroke from a haemorrhagic stroke. Even more effective ways to reverse a stroke or evacuate a haemorrhage without damage would hopefully be discovered. Critical care specialists would continue to improve their understanding of the physiologic changes associated with acute brain injury to prevent and/or treat secondary ischaemia, inflammation and oedema. Overall, the goals of enhanced prognosis, recovery and outcome will still be pursued, and efforts of better stroke prevention and care will continue.

Source: [Critical Care Medicine](#)

Image Credit: iStock

Published on : Tue, 15 Jun 2021