Therapeutic Hypothermia Guidelines Urged in TBI

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SCOTTSDALE, ARIZ. — The next revision of 9-year-old guidelines for management of severe traumatic brain injury should endorse patient cooling, Donald Marion, M.D., chair of a committee evaluating the evidence on therapeutic hypothermia, said at the annual meeting of the Neurocritical Care Society.

Dr. Marion, a neurosurgeon and senior research fellow at the Brain Trauma Foundation, New York, said he intends to recommend that therapeutic hypothermia be a standard consideration in these cases and "that moderate hypothermia for 48 hours or less should be considered for patients with elevated ICP [intracranial pressure]."

His remarks were intended to give the society a "heads-up on a process that is really just starting." Dr. Marion said he anticipates the revised guidelines will be completed in 2006 and encouraged physicians to send him comments at donmarion1@yahoo.com.

The guidelines, created in 1996, are a joint project of the Brain Trauma Foundation, the American Association of Neurological Surgeons, the Congress of Neurological Surgeons, and the AANS/CNS Joint Section on Neurotrauma and Critical Care. According to Dr. Marion, "Evidence-based conclusions would support the following statements:

► Hypothermia improves outcomes.

► Hypothermia reduces elevated ICP.

► If the patient is cooled to greater than or equal to 32° C for no more than 48 hours, there are no clinically significant risks of infection, of cardiac arrhythmia, or coagulopathy."

He reported 10 of the 15 trials had at least 15 patients in each arm. Among these, he reviewed nine complete manuscripts (the exception being a study from China). That seven were single-center studies should not make them less highly regarded, according to Dr. Marion.

"In all seven there is a trend to improved outcomes, and most reach statistical significance. The only ones that don't show a trend to improved outcomes are the two multicenter trials," he said, questioning whether randomized multicenter trials are realistic for a condition as complex as traumatic brain injury (TBI).

Dr. Marion said that his analysis of cumulative outcomes from all nine studies found 52% of patients treated with hypothermia were alive and functional at designated times ranging from 3 months to 2 years afterward. Only 39% of those treated at normal temperatures did as well, he said. This 13% difference became 24% when the two multicenter trials were excluded.

He also described a published meta-analysis of hypothermia trials as flawed (Arch. Neurol. 2002;59:1077-83). It only gave weight to four trials, one of which had twice as many patients as the other three trials combined, he said. A second negative study (Ann. Surg. 1997;226:439-47) included few TBI patients and did not consider functional outcomes as distinct from mortality, Dr. Marion said.

A second presenter on clinical use of hypothermia, Stefan Schwab, M.D., of the University of Heidelberg (Germany), reported that his institution has cooled about 200 stroke patients. He characterized hypothermia as a promising neuroprotective therapy with the potential to control fever but said the evidence does not support making it a standard of care for ischemic stroke.

Among the many open questions still to be resolved, Dr. Schwab listed optimal time to target temperature, duration of cooling, target temperature, ventilation mode, and methods of cooling and rewarming. He also cited safety, efficacy, and whether it should be used in patients with moderate, severe, or very severe stroke.

"For optimal treatment of severe stroke, decompressive surgery is still the standard," Dr. Schwab concluded, speculating that hypothermia might be beneficial as an added therapy or in stroke cases that are severe but not very severe. "Obviously hypothermia is something that works, but we need to see how we can use it," he said.

Michael A. DeGeorgia, M.D., of the Cleveland Clinic Foundation reviewed studies that led to the International Liaison Committee on Resuscitation (ILCOR) task force advisory statement endorsing use of therapeutic hypothermia after cardiac arrest (Circulation 2003;108:118-21).

"We're further ahead in head trauma and cardiac arrest. Maybe this is something we should be doing in selective patients," Dr. DeGeorgia said. ■