ICU MANAGEMENT & PRACTICE

ICU Volume 7 - Issue 4 - Winter 2007/2008 - Congress Review

Induced Hypothermia & Neurological Outcome:

Author

Kees H. Polderman, *MD, PhD*

Department of Intensive Care

University Medical Center Utrecht

k.polderman@umcutrecht.nl

The 1st Therapeutic Temperature Management Congress

There is an increasing awareness in the critical care community of the importance of body temperature in determining outcome in patients with neurological injuries. Numerous studies have shown that development of fever is closely linked to increased neurological injury, even when no infection is present; this difference persists after multivariate analysis, suggesting that the link is a causal one. In addition, there is increasing evidence that inducing controlled hypothermia in the immediate aftermath of ischaemic injury decreases the extent of this injury; in some cases permanent injury can be completely avoided.

The meeting on therapeutic temperature management (TTM) that took place in Cancun, Mexico, from December 4-7, 2007 was the first to deal specifically with all aspects of controlled temperature management, as well as general issues pertaining to the care of patients with neurocritical illness. The “TTM Congress” drew more than one hundred experts from around the globe to discuss their experiences and research findings. The faculty included researchers as well as clinicians from the field of emergency medicine, intensive care, traumatology, neurology, cardiology, paediatric intensive care and neonatology.

General issues included thrombolysis in severe stroke (Patrick Lyden, San Diego, United States), reperfusion in patients with myocardial infarctions (Simon Dixon, Royal Oak, United States), management of patients with severe traumatic brain injury (Kees Polderman, Utrecht, The Netherlands), sex differences in resuscitation and the possible role of oestrogens and progestagens in preventing brain injury (Paul Pepe and Jane Wiggington, Dallas, United States and Dalton Dietrich, Miami, United States), management of braininjured patients in the field (Paul Pepe) and treating brain injuries from the battlefield (Rocco Armonda, Bethesda, United States), as well as many other topics.

Temperature management issues included fever control (Stephan Mayer, New York, United States), cooling for TBI and stroke (Kees Polderman and Patrick Lyden), spinal cord injury (Dalton Dietrich), myocardial injury (Simon Dixon), trauma (Samuel Tisherman, Pittsburgh, United States), hypothermia in children with TBI or anoxic injury (Reese Clark, Pittsburgh, United States) and neonates with asphyxia (Michael Cotton, Durham, United States).

Neonatal asphyxia probably represents the area with the strongest evidence for use of hypothermia; benefits have been demonstrated in 3 multi-centre RCTs, all published in 2005. However, most neonatological societies currently advocate a cautious approach, stating that routine usage of hypothermia should await longer-term follow up from the three multi-centred studies as well as the results of three additional multi-centred trials: ICE (infant cooling evaluation), TOBY (whole body hypothermia for the treatment of perinatal asphyxia encephalopathy) and nnn-Hypothermia (neo-neuro-network trial) that together have enrolled 829 patients. The results of these trials are expected in late 2008.

According to the present guidelines, hypothermia for neonatal asphyxia should still be regarded as an experimental treatment, and should only be used in the context of clinical trials. The pros and cons of this approach were extensively discussed at the TTM meeting. Some of the centres that have participated in one of the three abovementioned (already published) trials are now offering hypothermia as part of their routine patient care, and are helping other hospitals that want to start hypothermia programs. Most experts expect the new trials to show positive results. Thus, overall, it seems likely that usage of hypothermia in neonatal therapies will increase in the next few years.

Much TMM Congress attention also was devoted to implementation issues and to the practical aspects of temperature control, both in the hospital and pre-hospital setting. Doctors, nurses and ER staff shared their experiences and participated in discussions. Experiences with pre-hospital cooling (Mike Clumpner and Jim Mobley, Spartanburg, United States and Stephen Bernard, Melbourne, Australia) indicate that early cooling can be feasible with a low-tech approach. A doctor (Mauro Oddo, New York, United States) discussed the pros and cons of patient selection as well as the pitfalls and results of implementing a cooling protocol for cardiac arrest patients in everyday clinical practice. The nursing

perspective (May Kay Bader, Mission Viejo, United States) included discussion of both the nursing implementation of cooling and usage of various monitoring devices in patients with neurocritical illness.

Additional discussion (Stephen Bernard) was devoted to pros and cons of different cooling methods and devices. Preliminary results were released from the RICH study on very early cooling (pre-hospital, in the ambulance) to cooling in the ER (which is still early by most standards). Most attendants shared the view that although induction of hypothermia can be accomplished and/or facilitated by methods such as cold fluid infusion, ice packs, etc., a cooling device will probably be required for effective maintenance and controlled re-warming.

Finally, discussion (Kees Polderman) concerning the efficacy of cooling in traumatic brain injury concluded that the available evidence supports usage of cooling in TBI patients with high ICP in the early stages of injury. However, although it is widely accepted that hypothermia can help control intracranial hypertension, its usage to improve neurological outcome in TBI remains controversial.

The 2ND TTM Congress will take place in Barcelona, Spain, from October 1-4 2008.

Published on : Thu, 15 Aug 2013