

Acute Neuralgia in Infants can be managed with Cerebral Hypothermia and Temperature Control

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Abstract

resuscitation and cardiac arrest. In contrast, in the neonatal intensive care unit, the pathophysiology of brain injury from

down biological processes and ultimately leads to death. Cooling the body as a therapeutic intervention became widespread in his 17th century, when physicians such as John Froyer (1649–1734) began extensive experimentation with the use of hot and cold water in medicine. With the use of cryo-analgesia in amputations around the 19th century, surgeons discovered that the analgesic effect of cryo-analgesia was associated with reduced bleeding. Local head cooling for traumatic brain injury was used in the late 1800s, and whole-body cooling was first documented to treat head injuries [10].

In addition to the normal environment, the brain requires optimal pH, temperature, blood flow, and osmolarity to perform its functions. However, small disturbances in this complex system can have a large impact on brain function. One of the putative etiologies of encephalopathy is impaired glucose or oxygen supply to the brain. Encephalopathy and eventually coma can occur because the delivery of substances to the brain is greatly reduced. Hypoxia, especially hypoxia-ischemia, can permanently damage delicate areas of the brain such as the thalamus, hippocampus, and cerebellum. The extent and irreversibility of injury depend on the extent and duration of hypoxia or reduced cerebral perfusion. HIE, which is usually caused by severe hypotension or cardiac arrest, is triggered by a neuronal ischemic injury cascade that includes excitatory amino acid release, intracellular calcium influx, lipid peroxidation, and cell death.

In low- and middle-income countries, therapeutic hypothermia had no effect on the composite outcome of mortality or disability 18 months after neonatal encephalopathy, but alone significantly increased mortality. Although tertiary neonatal intensive care units are available, hypothermia should not be used to treat neonatal encephalopathy in low- and middle-income countries. According to a recent meta-analysis, hypothermia in neonatal encephalopathy reduces neurological severity.

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