

Longer cooling, lower temperature no improvement for infant oxygen deprivation

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Credit: CDC.gov

The standard treatment for newborns whose brains were deprived of oxygen appears to work better than proposed alternatives, according to a study from a National Institutes of Health research network. The standard treatment involves lowering an infant's body temperature by about 6 degrees Fahrenheit for 72 hours. Attempts to improve on this treatment by further lowering body temperature or increasing the duration of cooling were of no additional benefit, the researchers concluded.

Oxygen deprivation—before, during, and just after birth may result from a number of causes, including compression of the umbilical cord, loss of blood from a tear in the placenta or a tear in the womb. A [previous study](#) found that lowering an infant's body temperature after [oxygen deprivation](#) could reduce the risk of death or disability.

"Preliminary studies in animals suggested that lowering body temperature and increasing the duration of cooling might provide additional benefits," said study author Rosemary Higgins, M.D., program scientist for the Eunice Kennedy Shriver National Institute of Child Health and Human Development's Neonatal Research Network, which conducted the study. "Although the results are disappointing, they do show the need to test any modification of a treatment—no matter how promising it may appear—before putting it into practice."

Support for the study also was provided by NIH's National Center for Advancing Translational Sciences, and was published in the *Journal of the American Medical Association*.

Oxygen deprivation in newborns, also known as neonatal hypoxic-ischemic encephalopathy (HIE), is estimated to occur in 1 to 2 of every 1,000 live births in the developed world, according to the World Health Organization. Survivors may develop long-term disabilities, such as intellectual impairment or cerebral palsy.

Infants assessed as having HIE were randomly assigned to one of four treatments:

- Lowering body temperature to 92.3 degrees for 3 days (the standard treatment)
- 92.3 degrees for five days
- 89.6 degrees for three days
- 89.6 degrees for five days

The current study was confined to the time period that the [infants](#) spent in the hospital.

The researchers are observing the children as they grow and will report disability rates in a subsequent publication.

Although the differences in [survival rates](#) between the groups were not great enough to be statistically significant, infants receiving the standard treatment had a slightly higher survival rate than did the infants in the other groups. Only 7 percent of infants receiving the standard treatment died.

The researchers noted that survival rates for infants in all the groups in the current study were higher than the survival rate for the cooled infants in the original study showing that cooling could benefit infants with HIE. That study, published in 2005, established newborn cooling as the [standard treatment](#) for HIE. In that study, 19 percent of the cooled infants died—an improvement in the survival rate compared to the then-standard treatment

The researchers are not sure why the death rate was so much lower in the current study than in the original study. It's possible that the increase in survival may be due to overall improvements in newborn care in the last decade, Dr. Shankaran said.

"Our study indicates that physicians won't get a better outcome by making infants a little bit cooler for a little bit longer," Dr. Higgins said.

The researchers had planned to enroll 726 infants into the study. However, an independent committee that was monitoring the data undertook a statistical analysis indicating that there was less than a 2 percent chance of finding a benefit to longer or deeper cooling. Taking this analysis into consideration, along with the slightly higher survival rate of infants receiving the standard treatment, the researchers ended the study after only 364 infants had been enrolled.

"It looked like it would not be worth continuing the study, because the likelihood of benefit appeared to be really very low," said the study's first author, Seetha Shankaran, M.D., of the Children's Hospital of

Michigan in Detroit.

Provided by National Institutes of Health

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