
Aggressive Phototherapy Can Improve Neurodevelopmental Outcomes In Some Premies

The study was a multi-center clinical trial funded by the Neonatal Research Network of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), and the UT Medical School at Houston was the lead center in designing and conducting it.

"Before this study, we had very limited information from clinical research to indicate how phototherapy should be used in small premature babies. The only previous major clinical trial was performed more than 30 years ago and included only a few infants who weighed less than 1,000 grams, or 2.2 pounds. With all the advances in obstetric and neonatal care, these infants are much more likely to survive today, and we need large clinical trials like this to know how to achieve the best possible long-term outcomes," said co-author Jon E. Tyson, M.D., professor of pediatrics and obstetrics and the Michelle Bain Distinguished Professor in Medicine and Public Health at the UT Medical School at Houston.

Neonatal jaundice is a yellowing of the skin and other tissues in a newborn due to high levels of bilirubin, an indication that red blood cells are being broken down too quickly for the liver to process. The condition is caused by the newborn's overall physiologic immaturity, including immaturity of the liver. Phototherapy helps to reduce the bilirubin level and the risk of brain damage that can occur when bilirubin reaches high levels and crosses over from the blood into the brain.

The study involved nearly 2,000 infants who were born at 501 to 1,000 grams birth weight between September 2002 and April 2005 in hospitals of the Neonatal Research Network, including Children's Memorial Hermann Hospital and the Harris County Hospital District's Lyndon B. Johnson General Hospital.

Aggressive phototherapy reduced the infants' chances of having severe neurodevelopmental impairments, said Brenda Morris, M.D., former associate professor of pediatrics at the UT Medical School at Houston and principal investigator of the Neonatal Research Network study. "There was a 14 percent reduction in neurodevelopment impairment with aggressive phototherapy. This relative risk reduction was statistically significant, and we did not see any evidence of harm in the study's larger infants, those weighing 751 to 1,000 grams at birth," she said. Phototherapy was deemed aggressive when started in the first 24 hours of life and used until the bilirubin remained at very low levels.

In the smaller babies, the ones weighing 501-750 grams, Tyson said, the results suggest that the reduction in profound impairment may be offset by a trend toward a somewhat higher mortality rate. However, this increase was not statistically significant and may have simply occurred by chance. Tyson added that the Neonatal Research Network is in the planning stages of a trial which would investigate another treatment option for jaundice.

A special feature of the phototherapy trial was the use of an innovative method of statistical analysis (Bayesian analysis) used in evaluating the study results. These analyses were performed by Claudia Pedroza, Ph.D. at The University of Texas School of Public Health. Other study personnel include: Kathleen Kennedy, M.D.; Georgia McDavid, R.N.; Patricia Evans, M.D.; Pamela J. Bradt, M.D.; Laura L. Whiteley, M.D.; Patty A. Cluff, R.N.; Anna E. Lis, R.N.; Claudia Y. Franco, R.N.; Maegan Currence, R.N.; Nora I. Alaniz; Patti L. Tate; Sharon L. Wright, and Esther G. Akpa, R.N.

Journal reference:

Morris et al. Aggressive Versus Conservative Phototherapy for Infants with Extremely Low Birth Weight. New England Journal of Medicine, Oct. 30, 2008

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