Children with asymptomatic brain bleeds as newborns show normal brain development at age 2

October 30 2020

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In 2007, UNC researchers published unexpected and surprising results from a study based on magnetic resonance imaging (MRI) of newborn

brains. Twenty-six percent of the newborns in the study were found to have asymptomatic subdural hemorrhages, or bleeding in and around the brain.

It was an unexpected finding because subdural hemorrhage had been considered unusual in full-term newborns. But the 2007 findings suggested that small, asymptomatic brain bleeds might be a fairly common consequence of a normal vaginal delivery.

Now 13 years later, John H. Gilmore, MD, professor and vice chair of research in the UNC Department of Psychiatry and senior author of the 2007 study, and J. Keith Smith, MD, Ph.D., vice chair of the UNC Department of Radiology, have published a follow-up study in the journal *Radiology*, which also published the 2007 study.

"We were one of the first groups to systematically scan the brains of newborns and were very surprised to discover that small subdural bleeds are very common," said Gilmore, senior author of the new study and director of the UNC Center of Excellence in Community Mental Health. "Since the bleeds were so common, we believed that they did not have a significant impact on brain development, but had no hard data to know for sure. This follow-up study is reassuring and demonstrates that children with these minor perinatal bleeds have normal cognitive development at two years of age."

The new article is based on data collected from 311 infants between 2003 and 2016 as part of the UNC Early Brain Development Study. Neurodevelopmental outcomes were evaluated at two years of age using the Mullen Scales of Early Learning (MSEL). All of the infants had MRI brain scans and were evaluated for subdural hemorrhage as neonates and at ages one and two years.

In comparing the children with a history of subdural hemorrhage to those

without, study authors found no differences between the two groups in either MSEL scores or in total gray matter volumes. Also, at age two there was no evidence of rebleeding in the children who had subdural hemorrhages as neonates.

"There are two really important findings of this work," said Smith, who is the corresponding author of the 2020 study. "These small bleeds, which are very common, do not seem to harm brain development, and they also go away and don't predispose to later bleeding or other abnormalities."

More information: Carlos Zamora et al, Subdural Hemorrhage in Asymptomatic Neonates: Neurodevelopmental Outcomes and MRI Findings at 2 Years, *Radiology* (2020). DOI: 10.1148/radiol.2020201857

Provided by University of North Carolina Health Care