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Being born 4-6 weeks premature can affect brain structure, function

Study shows cognitive deficits, structural differences in brains of school-age children born late preterm

by **Carla Kemp** • Senior Editor

VANCOUVER, BRITISH COLUMBIA – The brains of children who were born just a few weeks early differ from those born on time, and these differences may affect learning and behavior, according to a study to be presented Monday, May 5, at the Pediatric Academic Societies (PAS) annual meeting in Vancouver, British Columbia, Canada.

Studies have shown that children who were born between 34 and 36 weeks' gestation (late preterm) have more social, behavioral and academic problems than children born at full term (37-41 weeks). However, few studies have looked at the brain structure of late preterm children.

Researchers from the University of Iowa conducted magnetic resonance imaging (MRI) scans on 32 children ages 7-13 years old who were born at 34-36 weeks' gestation. In addition, they administered cognitive tests to the children, including the Wechsler Intelligence Scale for Children, Benton Judgment of Line Orientation (which assesses visual perception), Grooved Pegboard (which assesses fine motor skills and coordination) and Children's Memory Scale. Parents also completed a behavioral assessment.

Results were compared to 64 children born at full term who were recruited for another study in which they completed the same cognitive and behavioral assessments, neurological exam, and MRI sequences as the late preterm group.

Preliminary analysis showed differences in both cognitive function and brain structure in the late preterm children compared to full term children. Functionally, late preterm children had more difficulties with visuospatial reasoning and visual memory. They also had slower processing speed. Processing speed refers to the ability to perform automatically a simple task in an efficient manner. Children with slower processing speed may require more time in the classroom setting to accomplish a task.

Structurally, the brains of late preterm children had less total cerebral white matter, which is critical to communication between nerve cells, and smaller thalami, a brain region involved in sensory and motor signaling.

"Late preterm birth accounts for 8% of all births each year in the United States, making it a public health issue," said presenting author Jane E. Brumbaugh, M.D., FAAP, associate, University of Iowa Stead Family Department of Pediatrics. "The effects of late preterm birth on the brain have not yet been fully characterized, and it has been assumed that there are no significant consequences to being born a few weeks early. Our preliminary findings show that children born late preterm have differences in brain structure and deficits in specific cognitive skills compared to children born full term."

Parents of late preterm children also reported more problems with hyperactivity, inattention, opposition and aggression than parents of full term children.

"The developing brain is vulnerable to what most might consider a minor 'insult' in being born late preterm. Moreover, these effects are enduring," said senior author Peggy C. Nopoulos, M.D., professor of psychiatry, neurology and pediatrics with University of Iowa Health Care.

To view the study abstract, go to http://www.abstracts2view.com/pas/view.php?nu=PAS14L1_3670.1.