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ARTICLE

Lasting Effects of Preterm Birth and Neonatal Brain Hemorrhage at 12 Years of Age

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OBJECTIVES. Our goals were to compare cognitive, language, behavioral, and educational outcomes of preterm children to term controls and to evaluate the impact of neonatal brain injury, indomethacin, and environmental risk factors on intellectual function at 12 years of age.

METHODS. A total of 375 children born in 1989–1992 with birth weights of 600 to 1250 g enrolled in the Indomethacin Intraventricular Hemorrhage Prevention Trial and 111 controls were evaluated. Neuropsychometric testing, neurologic examination, and interviews on educational needs were completed. Severe brain injury was defined as the presence of grade 3 to 4 indomethacin intraventricular hemorrhage, periventricular leukomalacia, or severe ventriculomegaly on cranial ultrasound.

RESULTS. On the Wechsler Scales of Intelligence for Children, the preterm cohort obtained a full-scale IQ of 87.9 ± 18.3, verbal IQ of 90.8 ± 18.9, and performance IQ of 86.8 ± 17.9. Preterm children obtained scores 6 to 14 points lower than term controls on all psychometric tests after adjustment for sociodemographic factors. On the Clinical Evaluation of Language Fundamentals (test

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language skills), 22% to 24% of preterm children scored in the abnormal ranges (<70) as o to 2% to 4% of controls. Preterm children with and without brain injury required more schoc services (76% and 44% vs 16%), and support in reading (44% and 28% vs 9%), writing (44 20% vs 4%), and mathematics (47% and 30% vs 6%) compared with controls. Preterm chi also displayed more behavior problems than their term counterparts. Severe neonatal brair was the strongest predictor of poor intelligence. Antenatal steroids, higher maternal educat 2-parent family were associated with better cognition, whereas minority status incurred a disadvantage. Indomethacin did not affect intellectual function among preterm children.

CONCLUSIONS. Preterm children born in the early 1990s, especially those with severe br injury, demonstrate serious deficits in their neuropsychological profile, which translates intc increased use of school services at 12 years.

Key Words: very low birth weight • prematurity • cognition • language • school outcomes

Abbreviations: IVH—intraventricular hemorrhage • BPD—bronchopulmonary dysplasia • periventricular leukomalacia • WISC—Wechsler Intelligence Scale for Children • VIQ—verb PIQ—performance IQ • FSIQ—full-scale IQ • PPVT-R—Peabody Picture Vocabulary Test CTOPP—Comprehensive Test of Phonological Processing • CELF—Clinical Evaluation of