

One case of extreme prematurity suggests a possible link between cerebellar injury and autism spectrum disorders

childhood
disability
LINK



Summary

Until recently, the cerebellum, which sits at the bottom of the brain behind the brainstem and is best known for coordinating movement, was not visible using conventional cranial ultrasound. Advances in neuroimaging, however, now allow a better view of the cerebellum, illuminating cerebellar injury as an important problem in premature infants. It seems that, beyond motor impairments, ex-preterm survivors of cerebellar injury go on to develop cognitive, social, and behavioral deficits.

Close documentation of the clinical and neurodevelopmental course of these infants will contribute to a deeper understanding of the risks associated with cerebellar injury in premature infants and how to best manage these. This study reports on one male born at 23 weeks and 4 days of gestation, weighing 650g. The neonate had an uneventful prenatal course, but showed intraventricular hemorrhage upon cranial ultrasound at 10 days of life. The hemorrhage resolved by 30 days of life, but left cystic necrosis at 80 days of life. MRI at 80 days of life also showed diffuse loss of cerebellar tissue, and a second MRI at 20 months confirmed this tissue loss and also demonstrated a reduced vermis volume.

Notable neurological abnormalities first appeared at 3 months of age, and continued to develop through to 4 years of age, when the child was diagnosed with autism. Important developmental findings included diminished eye contact and inconsistent response to name at 9 and 18 months, late walking at 4 months, late talking at 30 months, and ataxic gait, oculomotor apraxia, and decreased reciprocal social interaction at 36 months.

What families should know

This report of a survivor of extreme prematurity with cerebellar injury, who was diagnosed with autism spectrum disorder (ASD), adds to growing evidence of a link between this

spectrum of disorders and prematurity-associated cerebellar injury. This link fits with our improving understanding of the cerebellum as a brain region that, beyond movement, also regulates cognition and learning, social conduct, emotion, and behavior. As more ex-preterm survivors of cerebellar injury are monitored for long-term development, physicians will be able to more readily evaluate the potential risk for ASD associated with extreme prematurity and cerebellar injury.

What practitioners should know

While the causes of cerebellar injury in premature infants remain debatable, this report highlights their importance in long-term neurodevelopment. Possible origins of prematurity-associated cerebellar injury include prenatal hemorrhage in the immature vasculature of the germinal matrix or occlusion of the inferior cerebellar artery distribution. The readily accessible mastoid cranial ultrasound view provides good visualization of the cerebellum and should become a standard procedure for premature infants. It has been well established that survivors of prematurity display an increased risk for later social and behavioral dysfunction, and this case report adds to an existing body of literature that suggests this may be due to a cerebellar origin of ASD.

Reference

Limperopoulos, C. (2010). Extreme prematurity, cerebellar injury, and autism. *Seminars in Pediatric Neurology*, 17(1), 25-29

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