

## NEONATAL CRANIAL ULTRASOUND LEADS TO EARLY DIAGNOSIS AND INTERVENTION IN BABY OF ALCOHOL-ABUSING MOTHER

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Typically, fetal alcohol spectrum disorders (FASD) are not diagnosed in children until developmental problems become apparent. To diagnose these children earlier would benefit both them and their caregivers. Neonatal cranial ultrasound has great potential diagnostic utility in the presence of known heavy prenatal alcohol exposure, in that it allows us to gather critical neuroanatomical information before the fontanel closes. This report describes the case of Baby S, in which the neonatal ultrasound was crucial in obtaining early fetal alcohol syndrome (FAS) diagnosis and facilitating an array of interventions for which the baby would not otherwise have been eligible. Now four years old, Baby S has received care in many different forms, and is making substantial progress. The early FAS diagnosis and subsequent interventions may have ameliorated, and continue to ameliorate, the poor developmental prognosis for many individuals with FASD.

**Keywords:** assessment, developmental disability, diagnosis, early intervention, fetal alcohol spectrum disorders (FASD), fetal alcohol syndrome (FAS), intellectual disability, mental retardation, neonatal cranial ultrasound

Fetal alcohol syndrome (FAS) is a leading preventable cause of mental retardation and a lifelong birth defect caused by maternal alcohol use during pregnancy.<sup>8</sup> The term fetal alcohol spectrum disorders (FASD) encompasses not only the formal diagnosis of FAS but also the broad range of central nervous system effects related to alcohol exposure in utero.<sup>5,11</sup> The neurodevelopmental deficits and other adverse outcomes associated with prenatal alcohol exposure have been well documented.<sup>3,7,9</sup>

Typically, FASD are not diagnosed in children until developmental deficits or behavior problems become apparent at age seven years or later. Almost none are diagnosed as young babies.<sup>4</sup> To diagnose these children earlier would greatly benefit both them and their caregivers. We know from studies of risk factors for poor life outcomes that early FASD detection is one of the key protective factors for prevention or amelioration of these "secondary disabilities."<sup>10</sup> A recent study described how neonatal cranial ultrasound has great potential diagnostic utility in the presence of known heavy prenatal alcohol exposure, in that it allows us to gather critical neuroanatomical information before the fontanel closes.<sup>1</sup> Such usefulness is not necessarily merely "potential"; in this report we describe one such case in which the neonatal ultrasound was conclusive.

### THE CASE OF BABY S

Baby S's mother was an alcoholic who reported drinking an average of 1500 cc of wine daily during the first and second trimesters of pregnancy. Her son weighed 2018 grams (30th percentile for gestational age) when he was delivered at gestational age 34 weeks in 2001. At birth, Baby S had facial features of fetal alcohol syndrome (FAS), but these were not noted at the time. Medical attention at delivery was focused on the baby's morphine withdrawal as a result of his mother's pain medication for bacterial endocarditis during the last four weeks of the pregnancy. Soon after delivery, Baby S went to a special care center for withdrawal management and for treatment of feeding problems due to difficulty in swallowing. At the same time, his mother enrolled in a case management intervention specifically designed for pregnant and postpartum women who abuse alcohol and drugs,<sup>2</sup> and entered a residential treatment facility for her alcoholism.

At three months of age, Baby S participated in a feasibility phase of a research project using intracranial ultrasound images to detect corpus callosum anomalies in newborn babies.<sup>1</sup> Consent was obtained from his mother after the nature of the procedure was fully explained. His averaged ultrasound images clearly showed partial agenesis

of the corpus callosum, a trait not uncommonly encountered in FASD patients.<sup>6</sup> The finding was reported to the baby's mother and to his pediatrician. Shortly thereafter physical therapy and nutrition services were prescribed to meet the baby's ongoing special needs. At the same time Baby S was returned to his mother's care.

When Baby S was eight months old, this same ultrasound image (now serving as a primary indicator of central nervous system problems), along with his observable growth deficiency (height and weight now in the first percentile for postnatal age) and "classic face of FAS," supported an official diagnosis of FAS at a state-supported clinic. By this time Baby S was showing moderate delays in speech and language and increasingly apparent behavior problems. At 10 months of age he was approved for Developmental Disabilities services and enrolled in an infant/toddler early intervention program, one of the Washington State programs responsible for implementing the Individuals with Disabilities Education Act (IDEA), Part C. Here, a package of appropriate early intervention supports was initiated, including therapeutic childcare, nutrition services and physical, occupational, and speech therapy (which taught Baby S to use sign language). His mother was coached on techniques for the developmentally disabled toddler, including helping the baby respond to frustration and accommodate to transitions.

Although Baby S was recognized as having developmental delay, it took nearly a year and a half, until he was 29 months old, for the mother to obtain Social Security benefits for him. The initial petition was denied because of "no evidence of long term disability found." The subsequent appeal was won on the basis of his FAS diagnosis. The additional benefits allowed for increased therapeutic services and support services for home care. At age 3 Baby S was enrolled in a developmental preschool program through the public school system.

## DISCUSSION

Baby S is now four years old. A speech therapist continues to work with him, and his adaptive skills continue to improve. He shows no delays in fine or gross motor skills compared to his peers. He has some speech delays, and a moderate vocabulary; he is capable of communicating in sign language. While we can't tell how much more serious his problems and delays would have been without all the early

interventions, nevertheless it is apparent that this child has received care in every modality available in his community, and that he is making acceptable progress. The early FAS diagnosis empowered caregivers to schedule interventions for which Baby S would not otherwise have been eligible and that may have ameliorated, and continue to ameliorate, the poor developmental prognosis for most individuals with FASD.

In conclusion, we recommend that in the presence of known heavy prenatal alcohol exposure, conventional neonatal cranial ultrasound be performed in order to detect potentially important neuroanatomical information before the fontanel closes. Ultrasound findings alone cannot do the work of FASD classification, but they can support early detection of FASD in order to prevent secondary disabilities in the child, and, if interventions can be put in place for the birth mother, help prevent future births of alcohol-exposed siblings.

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