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# Mental Disorders Among Children Born With Neonatal Abstinence Syndrome

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Despite high incidence of neonatal abstinence syndrome (NAS) (1), a drug withdrawal condition resulting from in utero opioid exposure, there are limited longitudinal data regarding children's outcomes (2). This study extends previous work by examining psychiatric outcomes in early childhood for a sample of Medicaid-covered infants with NAS compared with all other births.

Using claims from Truven Health Analytics' Multi-State Medicaid Database, we used ICD-9 codes to identify infant live-birth (codes V30-V39) records from January 2008 through September 2010 with 5 years of continuous enrollment and a diagnosis of NAS (code 779.5, N=1,046) and all other births (N=269,726) [see online supplement]. Outcomes were mental disorders diagnosed between ages 1 and 5 years (Chapter V codes, 290–319).

Approximately half of the children with NAS had a diagnosed mental disorder before age 5, compared with 30% of all other births ( $p<.05$ ) (Table 1). Compared with all other births, children born with NAS were over twice as likely to have disturbance of conduct, hyperkinetic syndrome of childhood, adjustment reaction, and intellectual disabilities and were over 1.5 times more likely have specific delays in development and other disorders.

These findings demonstrate that NAS is a marker for high levels of risk of psychiatric conditions in early childhood. Because of environmental and other confounders, we are able to note only an association between NAS and mental disorders, not a causal relationship. Type of opiate or other substance exposure *in utero* and postnatal treatment likely contributed to the outcomes as well.

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**TABLE 1. Mental disorders among children born with NAS and all other births<sup>a</sup>**

ICD-9 diagnostic category and code group	NAS births (N=1,046)		All other births (N=269,726)		Z score
	N	%	N	%	
Any mental disorder	511	48.9	81,814	30.3	12.996*
Specific delays in development (e.g., language, coordination) (315)	327	31.3	49,591	18.4	10.719*
Disturbance of conduct (312)	113	10.8	10,879	4.0	11.073*
Hyperkinetic syndrome of childhood (e.g., ADHD) (314)	94	9.0	9,372	3.5	9.687*
Adjustment reaction (309)	75	7.2	7,799	2.9	8.220*
Acute reaction to stress (308)	49	4.7	8,123	3.0	3.156*
Neurotic disorders (e.g., anxiety) (300)	43	4.1	7,365	2.7	2.731*
Special symptoms or syndromes (307)	41	3.9	9,672	3.6	.579
Disturbance of emotions specific to childhood and adolescence (313)	39	3.7	5,350	2.0	4.033*
Intellectual disabilities (317–319)	37	3.5	4,074	1.5	5.351*
Psychoses with origin specific to childhood (e.g., autism spectrum, pervasive developmental disorders) (299)	32	3.1	4,752	1.8	3.179*

<sup>a</sup> Diagnoses may co-occur. Prevalence of all other diagnostic code groups less than 1%. Source: Truven Health Analytics' Multi-State Medicaid Database.

\* $p<0.05$

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