



Persistent Developmental Delays in Children Born with Neonatal Abstinence Syndrome and In Utero Drug Exposure

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ABSTRACT

In utero drug exposure can impact child development. This study examined visual motor and receptive/expressive language data for children born with NAS and IUDE. Results indicated significant deficits in visual motor scores and receptive and expressive language scores. Significant differences were found between diagnosis groups.

LITERATURE REVIEW

Numerous long-term effects have been associated with NAS. Scores on cognitive assessments are often lower for children born with NAS (Yeoh et al., 2019). NAS has also been associated with long-term language, motor, and visual deficits (Merhar et al., 2018). Concerns for attentiveness and behavior have been identified in school-aged children born with NAS (Sandtorv et al., 2018). Developmental delays for children born with NAS have been linked with lower long-term academic performance (Oei et al., 2017). Children born with NAS are significantly more likely to be referred for evaluation and subsequently qualify for special education (Fill et al., 2018). The continued need for support has significant implications for educational teams serving students born with NAS.

METHODS

Research question: *What are the developmental outcomes for children born with Neonatal Abstinence Syndrome and In Utero Drug Exposure? What variables have significant relationships with development for these populations?*

Hypothesis: Deficits in visual motor and receptive/expressive language scores would be indicated for this population.

Research design: Quantitative study on existing data

Participants: $n = 106$ children with consistent follow-up with a NAS clinic in Southwest Ohio

Measures: 1) The Capute Scales Cognitive Adaptive Test (Accardo & Capute, 2005), and 2) The Rossetti Infant-Toddler Language Scale (Rossetti, 2006)

Procedures: Scores were recorded and analyzed for children between birth and 24 months with at least two follow-up data points that were at least 10 months apart.

RESULTS

General Findings:

- Cognitive Adaptive Test (visual motor): The CAT scores on the cognitive adaptive test at the initial assessment were significantly below the expected value of 100, $t(105) = -4.642, p = .00$. The CAT scores on the cognitive adaptive test at the final assessment were significantly below the expected value of 100, $t(105) = -2.632, p = .01$.
- Speech and Language: Scores for receptive language were significantly lower than data for nonexposed peers from similar research studies at initial and final assessments ($X^2(2, N=106) = 82, p = .00$ initial; $X^2(2, N=106) = 138, p = .00$ final). Compared with the initial receptive language assessment, more children were below the developmental range for receptive language at the final assessment. Scores for expressive language were significantly lower than data for nonexposed peers at initial and final assessments ($X^2(2, N=106) = 81, p = .00$ initial; $X^2(2, N=106) = 221, p = .00$ final). Compared with the initial expressive language assessment, more children were below the developmental range for expressive language at the final assessment.
- Diagnosis: Significant differences for initial CAT scores were found based upon diagnosis, $t(106) = 5.135, p = .00$. Significant differences for the final CAT scores were found based upon diagnosis, $t(106) = 2.428, p = 0.19$. Children with the IUDE only diagnosis scored significantly lower both CAT assessments. In contrast, children with IUDE only diagnosis had a positive, significant rate of change on the CAT assessment ($t(106) = -3.373, p = .001$). Similar differences were indicated for initial language scores but not for final scores and rate of change.
- No significant relationships were indicated for gender, race, environment, or drug and visual motor and language assessment scores.

DISCUSSION

- **Limitations:**
 - No control group for this study
 - Limited sample compared with population
 - Limited research available on the reliability and validity of measures
 - Outcomes could be impacted by follow-up care and therapies for this group
- **Future Research** Long term outcomes and the needs of school-age children warrant further research. Multiple sets of twins were represented within the study sample.
- **Implications for Practice:**
 - Routine follow-up monitoring and early intervention as implicated
 - Transition planning from clinic care to school environments
 - Developing educator understanding of the needs of this population

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