Title: Understanding Autism Spectrum Disorder Symptomology When Evaluating Children with Neonatal Abstinence Syndrome

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Introduction: Increased attention has been given to the opioid epidemic in the United States that is currently impacting individuals across the lifespan, including infants that have been exposed to opioids during pregnancy (Yule, 2017). Neonatal Abstinence syndrome (NAS) is characterized by withdrawal symptoms observed in newborns shortly after birth that cause hyperactivity of the central and autonomic nervous systems including irritability, hypertonia, sleep disturbances, gastrointestinal system dysfunction, and respiratory distress (Reddy, Davis, Ren, & Greene, 2017). Infants with NAS are at increased risk for later developmental and behavioral problems in early childhood including language delays, inattention, hyperactivity, learning difficulties, and social-communication problems (Hunt et al., 2007; Maguire et al., 2016; Oei et al., 2017; Sundelin, Wahlsten, & Sarman, 2013). These neurodevelopmental impairments often look similar to symptoms observed in children diagnosed with Autism Spectrum Disorder (ASD), which is characterized by deficits in social-communication skills and restricted and repetitive behaviors. Despite the overlap in behavioral phenotypes in children with NAS and ASD, little is known about traits that are shared and distinguished across these populations. Given the increased prevalence of opioid abuse and NAS (Pryor et al., 2017), it is critical to identify populations that may be at greater risk to inform differential diagnosis and treatment practices. The present study aims to characterize symptoms of ASD in children with NAS and compare ASD symptomology in children with and without NAS diagnosed with ASD.

Methods: Data was gathered through a retrospective chart review study. Total participants consisted of 64 children between the ages of 2-5 years that presented to the Child Development Center at a tertiary care hospital between the years 2010-2016. Participants included 31 children that received a medical diagnosis of NAS in infancy. This sample was further characterized to include children with NAS that were diagnosed with ASD (NAS+ASD; N = 16) and children with NAS without a diagnosis of ASD (NAS-; N = 15). A randomized comparison sample of children with ASD without a history of NAS (ASD-; N = 33) was included and matched to the NAS+ASD sample based on gender, chronological age, and cognitive ability. Multiple measures of autism symptomology provided data based on caregiver report and behavioral observation. Measures of ASD symptomology included T-Scores on the Autism Spectrum Rating Scale (ASRS) and total raw scores on the Childhood Autism Rating Scale (CARS-2). Evaluations and diagnostic impressions were completed by a team of psychologists, developmental pediatricians, speech and language pathologists, and psychology trainees.

Results: Overall, results indicate significant differences in ASD symptom presentation in children with and without NAS. Within the NAS sample, children in the NAS+ASD group were reported by caregivers on the ASRS to display more impairment on measures of atypical language (M = 56.7) and stereotypy (M= 63.0) than the NAS- group (M = 49.6 and 61.1 respectively). No significant mean differences were reported on overall measures of ASD symptomology as measured by the ASRS Total (NAS+ASD =70.5; NAS- = 68.0) and DSM (NAS+ASD M = 73.2; NAS- M= 70.7) scales. The CARS-2 total raw scores were significantly different across groups with the ASD- (M = 38.1) group displaying the most symptoms compared to the ASD+NAS (M= 34.8) and NAS-groups (M = 23.5). Comparisons between the NAS+ASD and ASD- groups indicated no significant mean differences across ASRS Total (NAS+ASD = 70.5; ASD- = 69.8) and DSM scales (NAS+ASD = 73.2; ASD- = 72.3). On ASRS subscales, the NAS+ASD group was reported to display more impairment on measures of peer socialization (M = 76.9) and less atypical language (M = 49.6) than the ASD- group (M = 73.4 and 57.4 respectively).

Discussion: In the current study, we found shared and unique profiles of ASD symptomology in children with and without NAS. This preliminary investigation suggests that children with NAS can reach diagnostic threshold for ASD. Children with NAS and diagnosed with ASD may also have preserved language abilities relative to children with ASD without a history of NAS. The opioid epidemic is a public health crisis that is calling for attention to examine prevention, early intervention, and a better understanding of developmental trajectories of infants exposed to opioids during pregnancy. It is important to examine how behavioral symptoms emerge and present in children NAS in order to gain a better understanding of how different etiological pathways may result in behavioral profiles associated with ASD.
References/Citations:


