Title: Premature Birth, Birth Weight, and Positive Screening for Autism Spectrum Disorder

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Introduction: Premature birth has been identified as a significant risk factor for autism spectrum disorder (ASD) in several previous studies (Abel et al., 2013; Dodds et al., 2011; Hwang, Weng, Cho, & Tsai, 2013). However, findings regarding the association between low birth weight and gestational age have been mixed, with some studies suggesting that both are significant risk factors for ASD (Larsson et al., 2005; Limperopoulos et al., 2008) and others indicating that low birth weight may be a better predictor than prematurity (Schendel & Bhasin, 2008). This study aimed to determine if birth weight and gestational age are significant predictors of positive ASD screening when controlling for other predictive factors among a sample of infants and toddlers from an early intervention program.

Method: Participants were 7,526 infants and toddlers screened for ASD by Early Steps, the State of Louisiana’s Early Intervention System under the Individuals with Disabilities Act, Part C (mean age = 25.31 months). The Baby and Infant Screen for Children with aUtim Traits—Part 1 (BISCUIT- Part 1) was used to gather demographic and relevant medical data as well as screen for ASD symptoms. The Battelle Developmental Inventory, Second Edition (BDI-2) was used to measure developmental functioning.

Results: Chi-square analyses revealed a significant association between birth weight (coded categorically: very low, low, normal, high) and ASD screening outcome, $\chi^2(3, 7526) = 22.44, p < .001$, as well as between gestational age (coded categorically: very low, low, term) and ASD screening outcome, $\chi^2(2, 7526) = 19.28, p < .001$. To estimate the strength of the association between birth weight or gestational age with positive ASD screening, binary logistic regression analysis was conducted to determine the adjusted odds ratios of covariates in relation to screening outcome (positive or negative) when controlling for other factors. Gestational age was not found to be a significant predictor of ASD screening outcome. Very low birthweight was found to be a significant predictor of screening outcome, $\chi^2(1, 7526) = 26.20, p < .001$, with children weighing less than 1500g at birth $0.5$ (adjusted OR = 0.50, CI 95% .39-.65) times less likely to have a positive screen compared to children with normal birth weight (2500-4000g). Developmental delay, as measured by the BDI-2, was found to be a significant predictor of screening outcome, $\chi^2(1, 7526) = 1054.90, p < .001$, with its presence increasing the odds of a positive screen by almost 9 times (adjusted OR = 8.93, CI 95% 7.82-10.19).

Discussion: In contrast to previous findings, young children with very low birth weight (<1500g) were found to be less likely to screen positive for ASD compared to those with normal birth weight (2500-4000g). Additionally, although gestational age was significantly associated with ASD screening outcome in bivariate analyses, it was not found to significantly predict screening outcome when controlling for other variables. Results suggest that developmental delay is a greater risk factor for positive ASD screening than either premature birth or low birth weight. Parents and caregivers of premature children may be more likely to refuse screening or be more conservative in responding to screening items.
References/Citations:


