

Dose-response Effect of Prenatal Alcohol Exposure on Perinatal Outcomes

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Background: Fetal Alcohol Spectrum Disorders (FASD) are one of the most prevalent neurodevelopmental disorders, yet studies examining the effect of specific patterns and levels of prenatal alcohol exposure (PAE) on perinatal and neurodevelopmental outcomes are scarce. The objectives of this study are to examine PAE effects of low-to-moderate exposure on adverse perinatal outcomes.

Methods: Data (n=112) for this analysis were combined from three interrelated prospective cohort studies conducted at the University of New Mexico. All cohorts included patients with PAE, assessed by Timeline Follow-Back (TLFB), binge drinking episodes, AUDIT questionnaire, and a battery of ethanol biomarkers. These data were abstracted from medical records: gestational age at delivery, birth weight (BW) and corresponding percentile (BW%tile), length (BL and BL%tile), occipito-frontal circumference (OFC and OFC%tile). Spearman correlation between TLFB derived measures (absolute ounces of alcohol per day (AAD), absolute ounces per drinking day (AADD) in periconceptual period and across pregnancy, mean AUDIT scores, number of binge drinking episodes in periconceptual period and perinatal outcomes were examined.

Results: The participant pool was diverse across race/ethnicity measures, education levels, and 50.9% were covered by Medicaid. Mean AAD across pregnancy was 0.4 ± 0.8 (equivalent to 5.6 standard drinks per week). Significant negative correlations were observed between AADD in periconceptual period and BW ($r=-0.22$; $p=0.02$), BL ($r=-0.30$; $p<0.01$), BL%tile ($r=-0.26$; $p<0.01$), and OFC ($r=-0.22$; $p=0.02$). AAD across pregnancy was associated with reduced BL ($r=-0.20$; $p=0.04$) and AADD across pregnancy was associated with reduced gestational age at delivery ($r=-0.19$; $p=0.04$). Number of binge drinking episodes in periconceptual period was also associated with reduction in gestational age ($r=-0.22$; $p=0.02$). AUDIT scores were negatively correlated with most measured perinatal outcomes.

Conclusions: These results indicate that reported low-to-moderate alcohol consumption at varying stages of pregnancy and binge drinking in prior periconceptual stages were significantly negatively associated with gestational and anthropometric measures.