**Enduring changes in immune function and health outcomes in individuals with Fetal Alcohol Spectrum Disorders**

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**Objectives:** Deficits in cognitive and executive function are well documented in children with Fetal Alcohol Spectrum Disorders (FASD); however, few studies have followed children with FASD into adulthood and almost none have investigated health outcomes. To address this gap, the current study was designed to evaluate health outcomes in adults with FASD. Moreover, evidence suggests that changes in immune function during development may be at the root of deficits that occur in numerous neurodevelopmental disorders. Indeed, prenatal exposure to alcohol has been shown to alter the immune environment, specifically resulting in changes in circulating levels of cytokines. Importantly, cytokines are potent modulators of development and there is evidence to suggest that prenatal exposure to increased cytokine levels may program the developing fetus, affecting neurobiological, physiological, and behavioral development. The hypothesis of the current study is that prenatal alcohol exposure alters the development of the immune system, which, in turn, affects the development of both brain and biological systems and may contribute to some of the long-lasting health problems seen in individuals with FASD.

**Method:** For the health outcomes, study participants included adults with FASD and unexposed controls. Participants completed health questionnaires examining domains including rates of early-life adversity (ELA) and physical and mental health status. As well, blood samples were collected for a complete blood count (CBC). For the investigation of the immune function, plasma samples from alcohol-exposed and unexposed children (2-3.5 years) were collected from 2007 – 2015 at two ONMI-Net sites in Western Ukraine and were used to measure 40 cytokines and chemokines, as well as vascular and angiogenesis markers.

**Results:** Preliminary results indicate that while there were no differences in autoimmune disease rates, adults with FASD report higher rates of early general symptoms of autoimmune diseases. With regards to mental health, adults with FASD have higher rates of anxiety, compared to unexposed controls. In addition, adults with FASD have elevated white blood cell counts compared to unexposed controls, and this is driven by increased neutrophils and lymphocytes. Examination of the immune function of alcohol-exposed and unexposed children identified unique immune profiles associated with prenatal exposure to alcohol, as well as differential immune profiles linked to neurodevelopmental status (typical development vs. neurodevelopmental delay).

**Discussion/Conclusions:** These data indicate that prenatal alcohol exposure results in life long changes in physical and mental health problems and in immune-related outcomes. Moreover, as inflammatory responses have been shown to play an important role in the pathophysiology of physical and mental health problems, ongoing work aims to further explore whether immune-related changes could be a driver of the health disorders in FASD.

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