

Perinatal Characteristics, Maternal Reproductive History, and Juvenile Idiopathic Arthritis: A Case-control Study

Samantha Bell

Background: Juvenile idiopathic arthritis (JIA) is a heterogeneous group of chronic inflammatory arthritis conditions in children with onset before 16 years of age. It is the leading cause of acquired short- and long-term disability in childhood. The etiology of JIA is largely unknown; however, there is increasing evidence that autoimmune diseases, including JIA, may be associated with maternal reproductive or early childhood exposures.

Methods: We conducted a case-control study of JIA cases identified at a regional children's hospital in the Seattle-Puget Sound area using linked birth certificate data from 1987-2009. Potential cases included all children <20 years with relevant International Classification of Diseases (ICD) codes who had received inpatient or outpatient care. Their records were linked to Washington State birth records for 1987-2010 to identify those with a Washington State birth certificate (n=1,518). For comparison, control children were randomly selected in a ratio of 4:1 from the remaining birth records, frequency matched on year of birth (n=6,072). Review of medical records further refined case ascertainment based on specific clinical criteria (n=1,254) and allowed categorization of cases into JIA subtypes. Multivariable logistic regression was used to estimate adjusted odds ratios (OR) and 95% confidence intervals (CI) for associations of JIA/JIA subtypes with maternal and early life exposures as measured in the birth certificates.

Results: Fewer cases (11.4%) than controls (13.3%) had a birth weight >4000 g (OR 0.81, 95% CI 0.67, 0.98). Mothers of cases (5.2%) were slightly more likely than those of controls (4.1%) to have had preeclampsia during their pregnancy (OR 1.29, 95% CI 0.96, 1.73). Decreased ORs were observed for JIA in relation to greater maternal parity (2 prior live births, OR 0.70, 95% CI 0.58, 0.85; 4+ prior live births, OR 0.68, 95% CI 0.48, 0.97), a finding also observed for the persistent oligoarticular JIA subtype.

Discussion: To our knowledge, no studies to date in the United States have examined these exposures in relation to JIA. Greater maternal parity, specifically having 2 or more prior live births, was significantly associated with a decreased OR for JIA, a finding consistent with both the hygiene and microchimerism hypotheses.

Thesis Committee:

Beth A. Mueller, DrPH (Chair)

Parveen Bhatti, PhD

J. Lee Nelson, MD