



Pre-Zika Descriptive Epidemiology of Microcephaly in Texas, 2008-2012

Due to the limited number of population-based studies on microcephaly, this study looked at the epidemiology of microcephaly in Texas in 2008-2012, prior to the Zika epidemic in the Western hemisphere. Associations between different maternal and infant risk factors for microcephaly were compared across four clearly defined case groups.

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Link to abstract:

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With the current interest in the Zika virus and the birth defect microcephaly, this study sought to describe the epidemiology of microcephaly in Texas prior to the Zika epidemic in the Western hemisphere. Data from the Texas Birth Defects Registry (TBDR) were used to assess the association between 12 maternal and infant risk factors with four microcephaly case groups: explained, unexplained, total (explained & unexplained), and severe unexplained. As definitions for microcephaly vary widely across the scientific literature, we sought to understand the baseline occurrence and patterns for this defect in Texas over a five year period (2008-2012). Poisson regression was used to obtain prevalence rates and crude and adjusted prevalence ratios (aPRs).

Main Findings

- ◇ The prevalence of microcephaly overall was 14.7 cases per 10,000 live births
- ◇ For the explained (i.e., of known cause) and unexplained case groups, an association between **four risk factors** and microcephaly were observed, for (i.) **maternal age**: older mothers (35+ yrs.) had an adjusted prevalence ratio (aPR) range of 1.2-4.1, vs. 20-29 yrs.; (ii.) **maternal education**: those completing ≤ 12 years, aPR range=1.4-1.9, vs. >12 yrs.); (iii.) **any diabetes** (aPR range=1.3-1.5); and (iv.) infants born **preterm** (aPRs=3.3). Among the unexplained cases, mothers were also more likely to be non-White or smokers.
- ◇ In all case groups, boys were 20-30% less likely than girls to have microcephaly
- ◇ Factors that reduced the risk for unexplained microcephaly included: young maternal age (<20 yrs.), multiparity (≥ 1 vs. no previous live births), and higher BMI (those in the overweight or obese range, BMI=25+ kg/m², vs. mothers with a normal pre-pregnancy BMI)
- ◇ Unexplained and 'severe unexplained' cases (head circumference $<3^{\text{rd}}$ percentile for gestational age and sex) had a similar risk profile across most factors examined
- ◇ Among 'severe unexplained' cases, microcephaly was inversely associated with pre-pregnancy obesity (aPR=0.6). Furthermore, among non-Hispanic Blacks, severe unexplained microcephaly was strongly associated with a lower education level (<12 yrs.; aPR=4.5), vs. completing >12 yrs

Conclusion and Discussion

Findings from this study point to different risk patterns across four distinct microcephaly case groups. Using data from the TBDR allowed for the examination of an array of factors, including maternal race/ethnicity, age, and smoking during pregnancy. Further examination of these factors in future analyses may provide additional insight into the underlying mechanisms of the associations observed.