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High Prevalence of Major Congenital Anomalies in Alaska, 1996–2002

Background

Birth defects affect approximately 3% of live births nationally and are considered the leading cause of infant death and childhood disability, resulting in more than $2.5 billion a year in hospital costs alone.[1] In Alaska, birth defects contributed to 33% of neonatal and 20% of postneonatal deaths during 1992–2002.

Methods

The Alaska Birth Defects Registry (ABDR) is a statewide, population-based registry, utilizing passive surveillance methodology for reportable birth defects. For this analysis, birth defects were categorized as major congenital anomalies (MCAs) according to criteria established by the National Birth Defects Prevention Network.[2] Key features of birth defects prevalence were analyzed in SAS using seven birth years (1996–2002) of ABDR data linked to Alaska birth certificates.

Results

MCAs were identified in 6% of live births (556 per 10,000 live births). Compared to white infants, Alaska Native infants were more likely to have an MCA (prevalence ratio, 2.6; 95% confidence interval [CI], 2.5–2.8), while black and Asian infants had similar rates to white infants. During multivariate analysis, controlling for gender and maternal age, prenatal alcohol and cigarette use, and prenatal care initiation, Alaska Native race continued to be associated with the risk of an MCA (adjusted odds ratio [aOR], 2.2; 95% CI 2.1–2.4). Maternal alcohol and cigarette use were significant covariates (aOR=3.3; 95% CI 3.0–3.7 and aOR=1.6; 95% CI 1.5–1.7, respectively). Higher rates in Alaska compared to national data were observed for almost all MCAs examined (Table 1). Cardiovascular anomalies were the most common birth defects, comprising 38% of all affected infants. Alaska Natives had higher rates for most categories of outcomes (Figure 1), including fetal alcohol spectrum disorders, the second most prevalent category (137 per 10,000 live births).

Discussion

We found the birth prevalence of MCAs in Alaska to be twice as high as the 3% reported for the United States as a whole.[3,4] There are limitations to using passive surveillance data to estimate and compare birth defects prevalence.[5] These limitations, including differences in surveillance methodology, reporting, and clinical practices may explain some of the disparities we identified. Our data indicates that Alaska Native infants have twice the risk of MCAs as white infants, with 10% of the birth cohort affected versus 4% of whites. Controlling for identifiable risk factors did not explain the racial disparity. Birth defects are caused by complex interactions between genetic and environmental influences; causal pathways for most birth defects are unknown. When etiologies are elucidated, however, preventive efforts can reduce racial disparities (as demonstrated by elimination of the Alaska Native disparity in neural tube defect prevalence following folic acid fortification of grain products).[6] Our observation of significant associations with prenatal alcohol and tobacco use and MCA prevalence emphasizes the importance of promoting healthy prenatal and preconception behaviors.

Recommendations

1. Health care providers caring for women of child-bearing age should recommend that these patients take a daily multi-vitamin containing 400 ug folic acid, avoid alcohol and cigarette use during pregnancy, consult with a health care provider prior to taking any medications during pregnancy, and avoid contact with known or suspected environmental teratogens.
2. Health care providers should be aware of the increased risk of congenital anomalies for Alaska Natives and insure optimal pre-conception and prenatal care for all patients.[7,8]

References

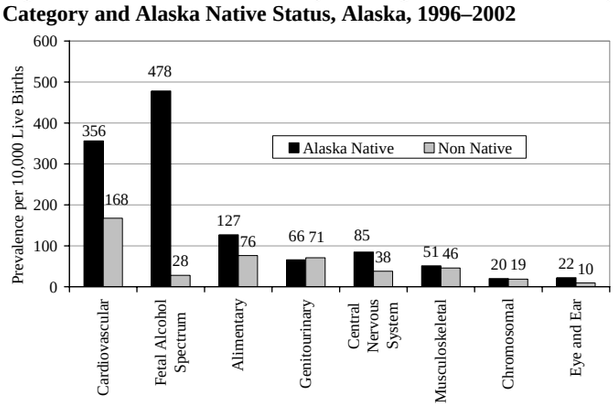
1. CDC. Hospital Stays, Hospital Charges, and In-Hospital Deaths among Infants with Selected Birth Defects - United States, 2003. MMWR. 2007; 56(02); 25-29. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5602a1.htm
2. NBDPN. Guidelines for Conducting Birth Defects Surveillance. http://www.nbdpn.org/current/resources/bdsurveillance.html
3. CDC. Update on Overall Prevalence of Major Birth Defects-Atlanta Georgia, 1978-2005. MMWR.2008.57(01);1-5. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5701a2.htm
4. CDC. Improved National Prevalence Estimates for 18 Selected Major Birth Defects United States, 1999-2001. MMWR.2006.54(51&52)1301-1305. http://www.cdc.gov/MMWR/preview/mmwrhtml/mm5451a2.htm
5. Schoellhorn KJ, Beery AL. Alaska Maternal and Child Health Data Book 2005: Birth Defects Surveillance Edition. Anchorage, AK. ADHSS, May 2006;3-4;15-22. http://www.epi.alaska.gov/mchepi/mchdatabook/2005.htm
6. Schoellhorn J. Decline in the prevalence of Neural Tube Birth Defects, Alaska 1996-2004. http://www.epi.alaska.gov/bulletins/docs/b2005_15.pdf
7. CDC. Recommendations to Improve Preconception Health and Health Care. MMWR Recommendations and Reports. 2006.55(RR06); 1-23. http://www.cdc.gov/mmwR/preview/mmwrhtml/rr5506a1.htm
8. AHRQ. National Guidelines for Routine Prenatal and Postnatal Care. http://www.guideline.gov/summary/summary.aspx?doc_id=9789&nbr=5242&ss=6&xl=999

Table 1. Prevalence Estimates for Common Major Congenital Anomalies per 10,000 Live Births, Alaska and US, 1996–2002

Congenital Anomaly	Alaska	United States*
Atrial Septal Defect	91.8	33.9
Ventricular Septal Defect	84.6	34.8
Patent Ductus Arteriosus	59.9	37.3
Hypospadias and Epispadias	36.4	30.0
Microcephalus	30.5	16.0
Obstructive Genitourinary Defect	30.4	25.1
Pyloric Stenosis	30.1	20-30
Pulmonary Valve Atresia/Stenosis	27.9	6.4
Congenital Hip Dislocation	27.1	10.0
Fetal Alcohol Syndrome	16.5	4.0
Cleft Lip	16.5	10.5
Down Syndrome (Trisomy 21)	15.3	13.7
Hydrocephalus	13.6	6.6
Hirschsprung's Disease	13.3	2.0
Cleft Palate	12.9	6.4
Rectal and Large Intestinal Atresia/ Stenosis	10.2	4.8

* References are detailed in: Schoellhorn KJ, Beery AL. Alaska Maternal and Child Health Data Book 2005: Birth Defects Surveillance Edition. Anchorage, AK. ADHSS, May 2006:171-176. Available at: http://www.epi.alaska.gov/mchepi/mchdatabook/2005.htm (see pages 171-6).
When national estimates were not available, comparison was derived from averaging rates reported by CA, CO, TX and GA.

Figure 1. Prevalence of Major Congenital Anomalies by Category and Alaska Native Status, Alaska, 1996–2002



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