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Decline in the Prevalence of Neural Tube Birth Defects, Alaska, 1996-2004

Introduction

Neural tube birth defects (NTDs) include anencephaly, encephalocele and spina bifida and can be prevented by maternal consumption of adequate amounts of folic acid during the peri-conceptional period. During 1992, the U.S. Centers for Disease Control and Prevention (CDC) issued recommendations that all women who are capable of becoming pregnant should consume 400µg of folic acid per day in order to reduce the number of NTD cases (1). During 1996, the FDA published a requirement that all commercial grain products be fortified with folic acid, effective January 1998 (2).

The Alaska Birth Defects Registry (ABDR) began collecting information on the statewide prevalence of NTD's during 1996, when birth defects became a reportable condition. The Alaska Pregnancy Risk Assessment Monitoring System (PRAMS), a population-based survey that samples 20% of women who recently delivered a live birth, began measuring folic acid awareness during 1996. Because of the instability of single-year prevalence estimates, we present trend data for NTD prevalence in five-year averages.

Results

Statewide NTD birth prevalence declined 50% between 1996 and 2004, from 7.9 to 3.9 cases per 10,000 live births (X^2 for trend, 6.5; $p = 0.011$). During 1996 through 2000, eight to ten NTD-affected infants were born each year compared to four each year during 2001 through 2004. From the beginning to the end of the study period, the five year average NTD birth prevalence declined 66% for Alaska Natives (X^2 for trend, 7.5; $p = 0.0062$) and 33% for non-Natives (X^2 for trend, 1.4; $p = 0.24$) (Figure 1). When stratified by Alaska Native status, there was no statistically significant difference in NTD birth prevalences for Anchorage and non-Anchorage residents.

Knowledge of the benefits of folic acid among women who delivered a live birth increased from 63% during 1996 to 81% during 2001. Knowledge of the benefits of folic acid was lower

among Alaska Native mothers (63% in 2001) compared to the overall population (81% in 2001); however, folic acid knowledge increased by 60% among Alaska Natives compared to 28% overall.

Conclusions

Birth defects surveillance data for Alaska demonstrate a 50% decline in NTD prevalence, meeting the CDC estimate of a 50% reduction in NTDs if all women of reproductive age consume the recommended dosage of folic acid (1). The excess risk of an NTD birth for Alaska Natives diminished between 1996 and 2004. Single-year data show that most of the decline in NTD prevalence among Alaska Natives occurred between 1998 and 1999, corresponding temporally with the FDA fortification mandate. Declines in NTD prevalence among non-Natives were not substantial until 2001-- three years after folic acid fortification of grain products and documented increases in folic acid knowledge. In addition to the effects of folic acid knowledge and grain product fortification, elective terminations of affected fetuses could have influenced disease prevalence; however, in Anchorage, where elective terminations are easier to obtain, the decline in NTD prevalence was identical to that seen in the rest of the state.

Recommendations

- All women of childbearing age should consume 400µg of folic acid daily.
- Health care providers in Alaska should continue to stress the importance of folic acid for all women of reproductive age.
- Family planning and women's health clinics should incorporate folic acid recommendations into pre-conception care.

References

1. CDC Recommendations for the use of folic acid to reduce the number of cases of spina bifida and other neural tube defects. MMWR 1992; 41(No. RR-14)
2. Food and Drug Administration. Food Standards: Amendment of Standards of Identity for Enriched Grain Products to Require Addition of Folic Acid. Federal Register: March 5, 1996;61(No. 44).

Figure 1. Birth Prevalence of Neural Tube Defects per 10,000 Live Births by 5 Year Moving Average and Alaska Native Status, Alaska, 1996-2004

