ESTIMATED ECONOMIC IMPACT OF FETAL ALCOHOL SYNDROME AND POTENTIAL COST SAVINGS THROUGH PREVENTION IN NORTH DAKOTA

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A CRITICAL REVIEW of "Fetal alcohol syndrome prevention: annual and cumulative cost savings." *Marilyn G. Klug and Larry Burd. Neurotoxicol Teratol. 2003 Nov-Dec;25(6):763-5.*

The incidence of fetal alcohol syndrome (FAS) has been estimated to be around 1 to 4.8 per 1000 births in the United States.[1] In addition to incidence studies, several estimates have been made of the economic impact of treating the congenital anomalies and cognitive deficiencies associated with FAS. Estimates of the annual economic impact of FAS in the United States ranged from $74.6[2] to as high $9.7 billion.[3] Stanage and colleagues[4] estimated that FAS in South Dakota cost $7.2 to $21.6 million per year. Another study determined that the total lifetime cost for a child with FAS born in 1980 was approximately $596,000.[3] Based on the incidence and economic impact of FAS from the literature, this condition clearly continues to be a major concern. To provide data on the potential financial savings from prevention of FAS, the paper by Klug and Burd attempts to estimate the economic impact for a child with FAS in North Dakota.

This study was conducted using the North Dakota Health Claims Database (NDHCD). The information was obtained from visits to health care facilities made by children from birth up to 21 years of age in North Dakota during 1996 and 1997. Subjects were classified as a case using the International Classification of Diseases, 9th edition (ICD-9) codes. The investigators used only healthcare costs to assess the annual and cumulative economic impact of FAS per child in North Dakota. Healthcare costs were determined by averaging the total annual cost of all subjects with FAS and subtracting the average annual cost of care for children in North Dakota who do not have FAS.

The results of the study demonstrated that the prevention of one case of FAS through prevention programs would result in a yearly savings of US$2,342. Extrapolating their findings, they stated that by preventing one case of FAS per year in North Dakota, there would be a savings of US$128,810 in 10 years. Based on this the researchers felt that implementation of more prevention programs for FAS would result in substantial cost savings.

For the analysis of their study, the investigators used ICD-9 codes to diagnose cases of FAS. Although FAS is commonly identified with the use of ICD-9 codes,[5] recognizing a child with FAS is still extremely difficult during the newborn period and thus often goes undetected.[6-8] One way to potentially overcome this challenge is the use of biological markers such as hair samples or meconium at birth to identify children at risk. Unfortunately, though these biological markers have generated great interest, they have yet to be confirmed by large population-based studies to validate such methods.[9] A convenient and validated method for a biological marker in detecting alcohol exposure *in utero* could serve as a substantial aid in detecting FAS.

The authors collected data on approximately 540,000 of the 637,000 residents in North Dakota from the NDHCD. The database did not account for uninsured individuals, whom were likely of low socioeconomic status, nor did the database have information for a portion of native Indians. Failure to include individuals of low socioeconomic status or indigenous people may potentially confound their results. The prevalence of FAS among native American Indians has been shown to be higher than in other ethnic groups.[2,10,11] Areas where poverty is endemic also have elevated rates of FAS relative to the general population.[10] As

importantly, the study only addressed health services covered by insurance and not the costs to parents (e.g., special education, courses, babysitting, etc). In addition, the study only analyzed FAS patients up to the age of 21, suggesting that the burden of FAS on the healthcare system is actually higher than their original findings when accounting for lifetime costs to healthcare. If one considers the issue of the under-detection of FAS, and the costs of special education, developmental disabilities services, supported living, and involvement with the criminal justice system, it is clear that the author's results may be a major underestimate of the cumulative cost of FAS.

Unfortunately, the paper also makes certain claims without citing references. For example, the authors mention the cause-specific mortality rate from FAS and related disorders to be 6%. Elsewhere in the paper is an assertion that prevention of FAS would also prevent cases of conditions co-morbid with FAS, such as epilepsy and cerebral palsy. Needless to say, such statements require citations to verify the validity of such broad generalizations.

The authors correctly identify the tremendous economic implications of treating cases of FAS. They also realize the prudence of improving preventive measures so that the financial burden of FAS and its impact on quality of life are reduced. Identifying and implementing effective strategies is needed as the prevalence of FAS may be increasing despite warnings of the fetal effects of *in utero* alcohol exposure.[12,13] Unfortunately, the results are marred by various confounders, such as a likely under detecting of FAS. It is now widely accepted that the failure to recognize and intervene with cases of FAS itself results in secondary disabilities that come at high costs.[13] In closing, the authors do not appear to report any new significant findings as their estimate of the annual costs for a child with FAS in North Dakota is an underestimate. More rigorous health economic methodology is needed to arrive, after so many attempts, at accurate estimates of the economic burden of FAS.

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