THE IHS PRIMARY CARE PROVIDER

A journal for health professionals working with American Indians and Alaska Natives

November 2011 **Volume 36 Number 11**

Assessment of Prenatal Hepatitis B Surface Antigen Screening at Indian Health Service Facilities in Arizona

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Abstract

Using the Indian Health Service (IHS) electronic medical record system, we conducted a retrospective cohort study to evaluate prenatal hepatitis B surface antigen (HBsAg) screening completeness and prevalence among American Indian women at three Arizona Indian Health Service facilities during 2005. The prenatal HBsAg screening rate was 99%; of 1,017 women screened during 2005, none (0%) were HBsAg-positive.

Introduction

During 2005, an estimated 24,000 births occurred among women in the US with chronic hepatitis B virus (HBV) infection, with a risk for perinatal infection among their infants as high as 90%. Approximately 85% - 95% of perinatal HBV transmission can be avoided through routine prenatal hepatitis B surface antigen (HBsAg) screening, universal vaccination of infants, and postexposure prophylaxis of infants born to HBsAg-positive women,[1] as recommended by the Advisory Committee on Immunization Practices (ACIP).[2] In Arizona the standard practice among health care provider is to follow ACIP recommendations to prevent perinatal HBV infection. Health care providers and laboratories are required to report all HBsAg-positive results, including those from prenatal screening within five working days to the Arizona Department of Health Services (ADHS). The Indian Health Service (IHS),

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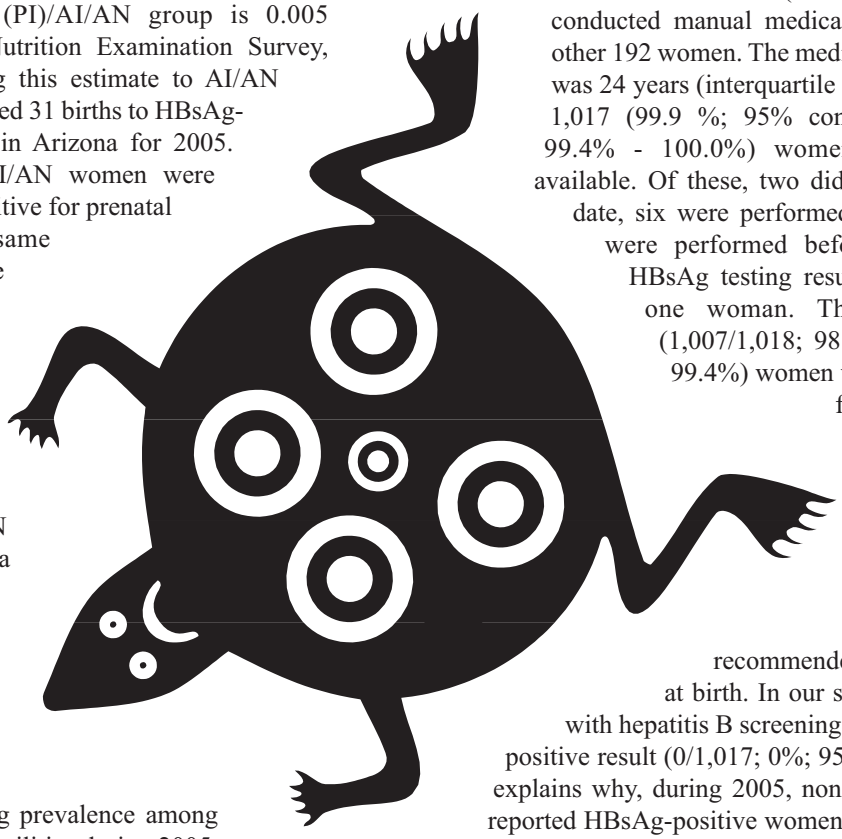
the federal agency responsible for health care for eligible American Indian and Alaska Native (AI/AN) populations, also follows ACIP recommendations and voluntarily participates in reporting HBV infections to ADHS.

During 2005, a total of 6,293 AI/AN births were recorded by ADHS. Of those, 2,458 (39.1%) occurred at eight IHS facilities. The national HBsAg prevalence estimate for the Asian/Pacific Islander (PI)/AI/AN group is 0.005 (National Health and Nutrition Examination Survey, NHANES III).[3] Applying this estimate to AI/AN births results in an expected 31 births to HBsAg-positive AI/AN women in Arizona for 2005. However, only three AI/AN women were reported to ADHS as positive for prenatal HBsAg during the same period. The difference between expected and reported cases led to concern regarding possible underreporting of prenatal HBsAg-positive screening results among AI/AN women. We conducted a retrospective cohort study in three of the eight IHS birthing facilities in Arizona to evaluate completeness of prenatal HBsAg screening, and to calculate prenatal HBsAg prevalence among AI/AN women at these facilities during 2005.



Methods

We identified three IHS facilities for this study and extracted data from each site's Resource and Patient Management System (RPMS), an electronic clinical and administrative data software program developed by the IHS. We performed manual medical record reviews when information was unavailable in RPMS. A case was defined as a positive prenatal HBsAg screening result in an AI/AN woman who delivered at one of the three selected IHS facilities during January 1 - December 31, 2005. For infants, we consulted RPMS or medical records to confirm administration of hepatitis B vaccine within 12 hours of birth when information regarding maternal HBsAg screening was incomplete or unavailable. We calculated screening completeness at IHS facilities by dividing the total number of women with prenatal hepatitis B screening by the total number of women who delivered during the study period.

Results

In 2005, a total of 1,018 women delivered at the selected IHS facilities, which represented 16.2% (1,018/6,293) of births from AI/AN women throughout Arizona and 41.4% (1,018/2,458) of births at Arizona IHS facilities. Information on prenatal HBsAg screening was available in RPMS for 81.1% (826/1,018) of women. We conducted manual medical record reviews for the other 192 women. The median age at time of delivery was 24 years (interquartile range = 20 - 28). Overall, 1,017 (99.9 %; 95% confidence interval [CI] = 99.4% - 100.0%) women had an HBsAg test available. Of these, two did not have a documented date, six were performed after delivery, and two were performed before pregnancy. Prenatal HBsAg testing results were unavailable for one woman. Thus, a total of 1,007 (1,007/1,018; 98.9%; 95% CI = 98.0% - 99.4%) women were adequately screened for HBsAg during their pregnancy. All newborns from women with inadequate hepatitis B screening (10) or with no available screening result (1) received recommended hepatitis B vaccination at birth. In our study, none of the women with hepatitis B screening available had an HBsAg-positive result (0/1,017; 0%; 95% CI = 0% - 0.4%). This explains why, during 2005, none of these three facilities reported HBsAg-positive women to ADHS.

Discussion

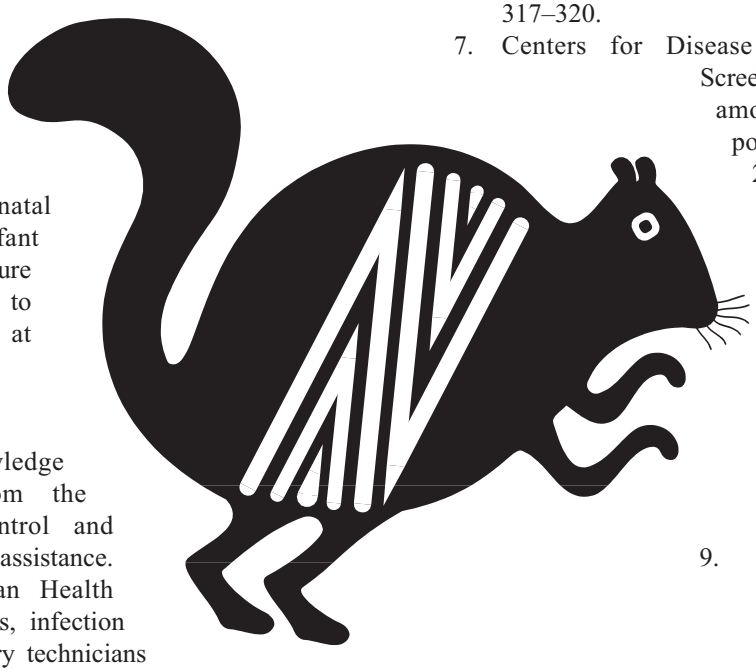
Data extracted from RPMS and medical records indicate that the rate of prenatal HBsAg screening at the IHS birthing facilities studied was high and in the range of (or higher than) rates documented in previous reports.[4,5,6] All women with a correctly administered prenatal screening were HBsAg-negative. Additionally, all perinatal management of infants born to mothers with unknown HBsAg status was according to ACIP recommendations.

The Asian/PI/AI/AN group ("other") in NHANES III combines population groups with different HBV infection prevalences. Although data regarding HBsAg prevalence among AI populations are limited, Asians and PIs are well-recognized groups at high risk for HBV infections.[7,8] In addition, the AN population has been previously documented to have higher risk for HBV infection than AI populations residing in the contiguous 48 states.[9,10] Using HBsAg prevalence from the NHANES III "other" group is probably inaccurate when applied to a single subpopulation (e.g., AIs),

because NHANES has not been designed to provide estimates for groups other than blacks, whites, and Hispanics. The true HBsAg prevalence for AI populations might be less similar to the relatively higher prevalence among blacks and other race/ethnicities than to the lower prevalence among whites. Therefore, applying the HBsAg prevalence estimates available through NHANES III for AI populations might lead to an inflated number of expected cases.

The findings in this report are subject to at least two limitations. First, this report describes maternal HBsAg screening at IHS facilities. The population included in our investigation, which represents <20% of AI/AN women who delivered infants in Arizona during 2005, might differ from AI/AN women who did not deliver at IHS facilities. Second, we reviewed AI/AN births at a subset of IHS facilities in only one state, Arizona. Maternal HBsAg prevalence might vary by region or tribe, and our findings might not apply to other AI populations.

RPMS was a useful resource to rapidly assess if prenatal HBsAg screening was complete and to calculate prenatal HBsAg prevalence. Because of the need to accurately assess perinatal hepatitis B transmission prevention practices among AI/AN populations, this method might be useful for evaluating the prenatal HBsAg screening, infant vaccination, and postexposure prophylaxis of infants born to HBsAg-positive women at other IHS or tribal facilities.



Acknowledgements

We gratefully acknowledge Lisa Jacques-Carroll from the Centers for Disease Control and Prevention for her technical assistance. Also, we thank all Indian Health Service public health nurses, infection control nurses and laboratory technicians who assisted this investigation.

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Disclaimer

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