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Surveillance of Stillbirth and Syphilis Screening Using Electronic Health Records

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Objective

To measure stillbirth delivery rates and syphilis screening rates among women with a stillbirth delivery using electronic health record data available in a health information exchange.

Introduction

Reports of infants born with congenital syphilis have increased in the United States every year since 2012. Prevention depends on high performing surveillance systems and compliance with the U.S. Centers for Disease Control and Prevention (CDC) recommendations to perform syphilis testing early in pregnancy, in the third trimester and at delivery if a woman is at high risk, and following a stillbirth delivery. These guidelines exist, because untreated syphilis is associated with adverse fetal outcomes including central nervous system infection and death.

Surveillance of congenital syphilis and stillbirth is challenging because available data sources are limited. Assessment of compliance with testing guidelines is particularly challenging, since public health agencies often lack access to comprehensive cohorts of tested individuals as most public health laws only require reporting of positive disease case information.

Methods

Using integrated electronic health records available in a community-based health information exchange, we examined syphilis testing patterns for women with a stillbirth delivery in Indiana between 2010-2016. The cohort was examined to determine whether the women received syphilis testing in accordance with the CDC recommendations. During this time period, Indiana recorded around 84,000 live births per year.

Data were extracted from electronic health records, including encounter data, laboratory test results and procedure data, captured by the Indiana Network for Patient Care (INPC), one of the largest community-based HIE networks in the United States. The INPC connects over 90 health care facilities, including hospitals, physicians' practices, pharmacy networks, long-term post-acute care facilities, laboratories, and radiology centers. In addition to clinical care, the INPC supports surveillance of STIs[1].

Women with a stillbirth delivery were identified using International Classification of Disease (ICD) Clinical Modification (CM) codes from the 9th and 10th editions (ICD-CM-9 and ICD-CM-10). Inclusion codes: ICD-CM-9 codes 656.4, 779.9, V27.1, V27.3, V27.4, V27.6, V27.7, V32.01, V32.1, V32.2, V36.1; and ICD-CM-10 codes P95, P96.9, O36.4, Z37.1, Z37.3, Z37.4, Z37.9.

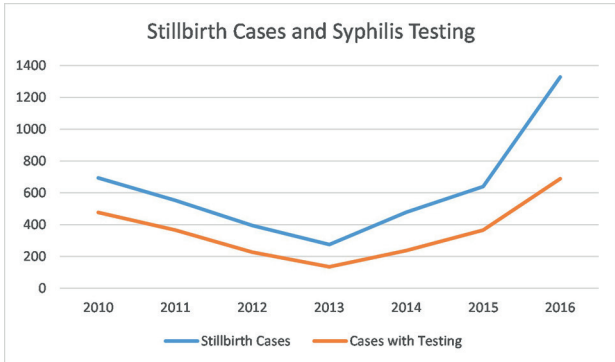
Using the master person index for the INPC, we linked stillbirth deliveries with pregnancy encounters and laboratory testing data. We analyzed documentation of syphilis testing during the pregnancy (up to 270 days prior to the stillbirth delivery) as well as after the stillbirth delivery (up to 30 days). Broad time ranges were utilized to account for potential delays in reporting of either the stillbirth delivery or the syphilis test results. Documentation could include either presence of a result from a laboratory test for syphilis or a CPT code (80055, 86780, 86781, 86592, 86593) indicating performance of a syphilis test.

Results

A total of 4,361 stillbirth deliveries attributable to 4,265 unique women were identified in the INPC between 2010-2016; representing a rate of 7.44 stillbirths per 1,000 live births during the same time period. Of the stillbirth deliveries, syphilis testing occurred within 270 days prior to or 30 days after delivery for 2,763 (63.4%) cases. Figure 1 displays the number of stillbirth cases observed each year and the number of cases in which syphilis testing occurred during the pregnancy or after delivery.

Conclusions

Using integrated electronic health records data, we discovered that fetal deaths occurred more frequently (7.44 versus 4.09 per 1,000) than previously estimated[2] through fetal death reporting mechanisms in Indiana. Furthermore, we observed increasing rates of stillbirth within Indiana in recent years. Integrated data further enabled measurement of syphilis testing rates for stillbirth cases, which were similar to those reported by Patel et al.[3] using a large, national administrative data set. Testing rates in Indiana are well below the targets set by national and international public health organizations. Accessing more complete data on populations using a health information exchange is valuable, although doing so may uncover a more negative picture of health in one's community. Deeper analysis of these trends is warranted to explore factors related to increasing rates as well as limited testing in this population.



Stillbirth cases and syphilis testing case counts between 2010-2016 in Indiana.

Keywords

Syphilis; Stillbirth; Health information exchange; Electronic health records

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