

OBSTETRICS

Temporal trends in maternal medical conditions and stillbirth

Emily M. Patel, MD; William H. Goodnight, MD, MSCR; Andra H. James, MD, MPH;
Chad A. Grotegut, MD, MHS

OBJECTIVE: The objective of this study was to estimate the prevalence and temporal trends of medical conditions among women with stillbirth and to determine the effect of medical comorbidities on the trend of stillbirth.

STUDY DESIGN: The Nationwide Inpatient Sample (NIS) for the years 2008–2010 was first queried for all delivery-related discharges. A multivariable logistic regression model was constructed with adjusted odds ratios (ORs) and 95% confidence intervals (CIs) calculated for medical conditions among women with stillbirth. The NIS was then queried for the years 2000–2010, and the effect of maternal medical conditions on the stillbirth rate was estimated.

RESULTS: From 2008 to 2010, there were 51,080 deliveries to women with stillbirth, giving a rate of 4.08 per 1000 live births. Women with stillbirth were more likely to be African American (OR, 2.12; 95% CI, 2.07–2.17), with an age less than 25 years (OR, 1.19; 95% CI, 1.16–1.22) or older than 35 years (OR, 1.40; 95% CI, 1.37–1.44) compared with women without stillbirth. Medical conditions such as cardiac, rheumatological, and renal disorders; hypertension; diabetes;

thrombophilia; and drug, alcohol and tobacco use, were independent predictors of fetal demise in multivariable logistic regression modeling. From 2000 to 2010, despite an increase in the total number of births to women with comorbidities, there was a significant decrease in the stillbirth rate, which was more pronounced among women with comorbidities compared with women without comorbidities ($P = .021$).

CONCLUSION: From 2000 to 2010, there was a significantly greater decrease in the stillbirth rate among women with maternal medical conditions than there was among women without comorbidities. These findings occurred despite an overall increase in the number of pregnancies to women with medical comorbidities over the time period. Because the NIS does not include information on gestational age, birthweight, or whether subjects had antepartum testing, we are not able to determine the effect of these variables on the observed outcomes.

Key words: nationwide inpatient sample, pregnancy, risk factors, stillbirth

Cite this article as: Patel EM, Goodnight WH, James AH, et al. Temporal trends in maternal medical conditions and stillbirth. *Am J Obstet Gynecol* 2015;212:673.e1-11.

Stillbirth is defined as intrauterine fetal death after 20 weeks' gestation or 350 g birthweight and the United States stillbirth rate in 2006 was 6.05 per 1000 live births.¹ Over the last 20 years, there has been a slight decline in the rate of stillbirth in the United States; however, the rate is still nearly 50% higher than the Healthy People 2010 target goal of 4.1 stillbirths per 1000 live births.² Additionally, there are still significant

racial and ethnic disparities, with stillbirth rates among non-Hispanic blacks greater than 2 times the rate of non-Hispanic whites.¹ This disparity is believed to be multifactorial in nature and largely remains unexplained.^{3,4}

Although nearly 25% of all stillbirths remain unexplained, of those that have a probable cause, maternal medical conditions contribute to nearly 1 in 5 stillbirths.⁵ The Stillbirth Collaborative

Research Network recently collected detailed information on 614 cases of stillbirth from 59 hospitals across the United States and identified maternal sociodemographic and medical factors associated with stillbirth.⁵ Non-Hispanic black race/ethnicity, advanced maternal age, obesity, nulliparity, multiple gestation, diabetes, and a history of previous stillbirth were all associated with stillbirth.⁵ Most larger studies determining the association of risk factors with stillbirth are limited to vital statistics with relatively limited data.¹ Furthermore, it is difficult to determine the effect of maternal medical conditions on the changing rate of stillbirth with vital statistics data.

The objectives of this study were to estimate the prevalence of maternal medical conditions associated with stillbirth using a large national administrative database and then to estimate the

From the Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Duke University School of Medicine, Durham (Drs Patel, James, and Grotegut), and Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, University of North Carolina School of Medicine, Chapel Hill (Dr Goodnight), NC.

Received Sept. 9, 2014; revised Nov. 7, 2014; accepted Dec. 15, 2014.

The authors report no conflict of interest.

Presented in part at the 34th annual meeting of the Society for Maternal-Fetal Medicine, New Orleans, LA, Feb. 3-8, 2014.

Corresponding author: Chad A. Grotegut, MD, MHS. chad.grotegut@duke.edu

0002-9378/\$36.00 • © 2015 Elsevier Inc. All rights reserved. • <http://dx.doi.org/10.1016/j.ajog.2014.12.021>

impact of the change in prevalence of maternal medical comorbidities on the change in the rate of stillbirth over the years 2000–2010.

MATERIALS AND METHODS

Study design

The study was reviewed and approved by the Duke University Institutional Review Board as exempt research. The Nationwide Inpatient Sample (NIS) from the Healthcare Cost and Utilization Project of the Agency for Healthcare Research and Quality was queried for all pregnancy-related discharges.

The NIS is a national database that contains hospital discharge data from more than 1000 hospitals in 45 states (2010) and represents the largest all-payer database for US hospital admissions. The hospitals in the NIS are stratified based on ownership, bed size,

teaching status, urban/rural location, and region. From each strata, the NIS contains approximately 20% of US hospitals and includes 100% of the discharges from those hospitals. From this sampling, the NIS provides weights to each entry that allows for national estimates to be produced.⁶

Because previous studies have shown that the prevalence of severe comorbid conditions has been changing rapidly among delivery hospitalizations, we examined maternal characteristics and risk of medical and obstetric complications among hospitalizations with and without stillbirth for the last 3 years of NIS data analyzed (2008–2010). This 3 year data interval has been chosen to ensure an adequate sample size.

Next, to determine the association of medical complications on stillbirth, we analyzed data over the 11 year period

from 2000 to 2010. Using the NIS for the years 2008–2010, all records containing a delivery discharge were identified. An admission for delivery was defined as any discharge record that included a delivery code (*International Classification of Diseases, ninth revision [ICD-9] codes 74.x for cesarean delivery [except 74.91]; V27, 72.x, 73.x, and 650 for general delivery codes [not utilized to specify vaginal or cesarean]*).

Deliveries were also identified by diagnosis-related group codes. Diagnosis-related group codes 765 and 766 were utilized to identify cesarean deliveries and codes 767, 768, 774, and 775 for vaginal deliveries.^{7–12} The ICD-9 codes used to identify discharges with stillbirth were 656.4x.¹³ Women without a code for stillbirth were assumed to have had a live birth. For comorbidities, both the ICD-9 code for a particular

TABLE 1
Demographic data among women with stillbirth

Variable	Stillbirth (n = 51,075)	Live birth (n = 12,473,044)	Unadjusted OR (95% CI)	P value
Race/ethnicity, n, %				
Caucasian (referent)	19,142 (37.5)	5,514,822 (44.2)	1.0	—
African American	10,943 (21.4)	1,479,890 (11.9)	2.12 (2.07–2.17)	< .0001
Hispanic	9040 (17.7)	2,396,294 (19.2)	1.09 (1.06–1.12)	< .0001
Asian/Pacific Islander	1636 (3.2)	554,846 (4.4)	0.85 (0.81–0.90)	< .0001
Native American	430 (0.84)	94,803 (0.76)	1.30 (1.18–1.43)	.0372
Other	1947 (3.8)	500,492 (4.0)	1.12 (1.07–1.18)	.0046
Missing	7938 (15.5)	1,931,896 (15.5)	—	—
Age, y				
15–24	18,297 (35.8)	4,195,809 (33.6)	1.19 (1.16–1.22)	< .0001
25–29 (referent)	12,845 (25.1)	3,505,305 (28.1)	1.0	—
30–34	10,320 (20.2)	2,905,125 (23.3)	0.97 (0.94–0.99)	< .0001
≥35	9485 (18.6)	1,837,864 (14.7)	1.40 (1.37–1.44)	< .0001
Missing	129 (0.3)	28,942 (0.2)	—	—
Age, y ^a	27.8 ± 15.1	27.6 ± 13.7	—	.006
Private insurance, n, (%)	20,740 (40.6)	6,000,743 (48.1)	0.69 (0.68–0.70)	< .0001
Low income ZIP code, n, % ^b	16,986 (33.3)	3,288,921 (26.4)	1.39 (1.37–1.42)	< .0001
Length of stay, d ^c	2 (1, 3)	2 (2, 3)	—	< .0001 ^c
Total charges, \$ ^c	11,254 (7331, 17,778)	10,019 (6807, 15,102)	—	< .0001 ^c

CI, confidence interval; NIS, Nationwide Inpatient Sample; OR, odds ratio.

^a Values are mean ± SD; ^b Low-income ZIP code defined as median household income in subject's ZIP code \$1–38,999 (lowest quartile); ^c Values are median (quartile).

Patel. Stillbirth and maternal conditions. *Am J Obstet Gynecol* 2015.

Download English Version:

<https://daneshyari.com/en/article/3432901>

Download Persian Version:

<https://daneshyari.com/article/3432901>

[Daneshyari.com](https://daneshyari.com)