

### 32 Racial and ethnic disparities in adverse obstetric outcomes and in the provision of obstetric care

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**OBJECTIVE:** To evaluate whether racial/ethnic disparities exist in adverse obstetric outcomes and in the provision of obstetric care, and if so, whether these disparities are explained by differences in patient or hospital characteristics.

**STUDY DESIGN:** We analyzed data abstracted concurrently from deliveries on 365 randomly selected days at 25 hospitals over a 3-year period. Race/ethnicity was categorized as Non-Hispanic White (NHW), Non-Hispanic Black (NHB), Hispanic, or Asian. Associations between race/ethnicity and postpartum hemorrhage (PPH), peripartum infection (INF), and severe perineal laceration (LAC) at SVD were estimated by univariable analysis, and after controlling for demographic differences among racial/ethnic groups and for hospital of delivery in fixed effects logistic regressions. Similarly, associations between race/ethnicity and types of obstetric care (eg, episiotomy) relevant to the adverse outcomes were compared in both univariable and multivariable analyses.

**RESULTS:** Of 115,502 studied women, 95% were classified according to one of the defined race/ethnicity categories. Disparities for all outcomes were observed, with NHW women least likely to experience PPH or INF, and NHB women least likely to experience LAC (Table,  $P < 0.001$  for all). These disparities persisted after controlling for differences in demographic characteristics as well as hospital of delivery. Every aspect of obstetric care that was examined also was significantly different according to race/ethnicity (Table,  $P < .001$  for all), even after controlling for demographic characteristics and hospital of delivery. There were no significant interactions between race/ethnicity and hospital of delivery.

**CONCLUSION:** Racial/ethnic disparities exist for adverse obstetric outcomes and in the provision of obstetric care, and do not appear to be explained by differences in demographic characteristics or by delivery hospital.

	NHW n = 52040	NHB n = 23878	Hispanic n = 27291	Asian n = 5999
<b>Adverse outcomes (%)</b>				
Postpartum hemorrhage	1.61	2.99	3.08	2.21
Infection	4.07	4.90	6.39	6.24
Severe perineal laceration	2.52	1.20	1.45	5.52
<b>Obstetric care (%)</b>				
Cesarean delivery	31.5	32.7	29.5	33.4
Labor induction	32.1	28.3	23.0	23.7
Dilation at admission in labor < 2 cm	15.4	14.6	11.7	16.3
Max. dose oxytocin $\geq 20$ mU/min	20.2	23.1	19.5	14.5
Onset of pushing to delivery > 2 hours	11.6	4.9	7.0	15.0
Episiotomy at vaginal delivery	13.6	4.9	5.3	24.0
General anesthesia at cesarean delivery	4.5	8.5	4.9	3.9

### 33 Obstructive sleep apnea is associated with increased risk of preeclampsia and eclampsia

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**OBJECTIVE:** To evaluate the risk of pregnancy related diabetes and hypertensive disease associated with obstructive sleep apnea.

**STUDY DESIGN:** This study used data from the 1998-2009 Healthcare Cost and Utilization Project Nationwide Inpatient Sample (HCUP-NIS). Among hospital discharges for women who were pregnant or gave birth, we used International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes to identify dis-

charges with and without a diagnosis of OSA. The outcomes of interest were gestational diabetes (n=2,489,181), pre-eclampsia (n=1,798,066), eclampsia (n=56,395), gestational hypertension (n=1,798,066), and preterm labor (n=4,889,853). We assessed trends in OSA-related discharges among maternal discharges using jointpoint regression. Multivariable logistic regression modeling was used to calculate adjusted odds ratios (AOR) and 95% confidence intervals (CI), using SAS survey procedures to account for the NIS sampling design. **RESULTS:** During the study period, there were a total of 55,781,965 pregnancy-related discharges. The rate of OSA from 1998-2009 was approximately 3.0 discharges per 10,000. However, the 1998 rate of 0.73 per 10,000 climbed to 7.3 per 10,000 in 2009, with an average annual increase of 24%. After controlling for age, race, and household income, women with OSA demonstrated an increased odds of gestational diabetes, pre-eclampsia, eclampsia, gestational hypertension, and preterm labor. Even after further adjustment for selected clinical conditions, including maternal obesity, OSA still remained risk factor for each outcome, except preterm labor.

**CONCLUSION:** The rate of OSA-related discharges among pregnancies has increased over the decade. OSA is independently associated with increased risks of pregnancy related gestational diabetes, and hypertensive diseases, including preeclampsia and eclampsia. Given public health implications of OSA complicating pregnancy, attention should be paid to reversing the trend of increasing OSA in women of reproductive age.

#### Adjusted estimates (odds ratios [AOR] and 95% confidence intervals [CI] for the association between obstructive sleep apnea and gestational diabetes, pre-eclampsia, eclampsia, gestational hypertension, and preterm labor

	Gestational diabetes <sup>a</sup>	Pre-Eclampsia <sup>b</sup>	Eclampsia <sup>b</sup>	Gestational HTN <sup>b</sup>	Preterm Labor <sup>c</sup>
N	2,489,181	1,798,066	56,395	1,798,066	4,889,853
Discharges excluded from analysis	Pre-existing diabetes	Pre-existing hypertension	Pre-existing hypertension	Pre-existing hypertension	N/A
Model 1: Crude	5.03 (4.50, 5.62)	4.53 (4.01, 5.12)	7.46 (4.58, 12.15)	2.40 (2.03, 2.83)	1.37 (1.22, 1.54)
Model 2: Adjust for age, race, income	3.95 (3.53, 4.43)	4.37 (3.86, 4.94)	7.98 (4.88, 13.05)	2.27 (1.92, 2.68)	1.30 (1.15, 1.46)
Model 3: Model 2 + obesity	2.05 (1.81, 2.32)	2.64 (2.32, 2.99)	5.82 (3.54, 9.58)	1.28 (1.08, 1.52)	1.30 (1.16, 1.46)
Model 4: Model 3 + clinical <sup>a</sup> and pregnancy <sup>**</sup> related factors	1.78 (1.57, 2.02)	2.48 (2.18, 2.82)	5.48 (3.31, 8.99)	1.27 (1.07, 1.50)	1.12 (0.99, 1.25)

<sup>a</sup>: Adjusted for: Cardiac disease, hyperlipidemia, renal diseases, adrenal diseases, hypothyroidism, depression, and existing hypertension; <sup>b</sup>: Adjusted for: Cardiac disease, hyperlipidemia, renal diseases, adrenal diseases, hypothyroidism, depression, and existing diabetes mellitus; <sup>c</sup>: Adjusted for: Cardiac disease, hyperlipidemia, renal diseases, adrenal diseases, hypothyroidism, depression, existing diabetes mellitus, and existing hypertension; (a, b, c)<sup>\*\*</sup>: Anemia, placenta abruption, placenta accreta, and placenta previa.

### 34 Optimal timing of term delivery in different ethnicities, a national cohort study

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**OBJECTIVE:** To study the competing risks of antenatal stillbirth versus intrapartu/neonatal death in three different ethnicities (Caucasian, Mediterranean and African) to obtain the optimal timing of delivery.

**STUDY DESIGN:** The study population comprised all term singleton births delivered between 36+0 and 42+6 weeks selected from the Netherlands Perinatal Registry (1999-2007). Cases with congenital anomalies, hypertension, pre-eclampsia, diabetes, small for gestational age (defined as birth weight <P10), other ethnicities or an elective cesarean were excluded. The remaining low risk cohort was divided in 3 groups; Caucasian, Mediterranean and African women. Numbers of antepartum stillbirth, intrapartu/neonatal death and neonatal morbidity (neonatal intensive care admission, meconium aspi-