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Differences in Perineal Lacerations in Black and White Primiparas

DENISE HOWARD, MD, MPH, PAMELA S. DAVIES, MD, JOHN O. L. DELANCEY, MD, and YVONNE SMALL, MS, RN

From the Department of Obstetrics and Gynecology and the School of Nursing, University of Michigan Health System, Ann Arbor, Michigan.

Abstract

Objective—To test the null hypothesis that there are no differences in incidence of perineal and vaginal lacerations in primiparous black and white women.

Methods—We reviewed University of Michigan Hospital delivery records, from July 1996 to December 1998, of black and white women 18 years and older and at least 35 weeks' gestation who had their first vaginal delivery. Birth weight, episiotomy, gestational age, laceration, length of second stage, oxytocin use, epidural use, and operative vaginal delivery were analyzed by univariable and multivariable tests.

Results—We analyzed 176 black women (mean age \pm standard deviation 23.7 ± 4.7 years; range 18–41 years) and 1633 white women (27.8 ± 5.4 years; 18–49 years; $P < .001$). Black women were less likely to have second, third, or fourth degree lacerations (43% compared with 59%; $P < .001$). The mean length of second stage of labor was shorter in the black women (73 ± 69 minutes; range 3–494 minutes compared with 106 ± 78 minutes; range 2–642 minutes; $P < .001$). Infants of black women weighed less (3292 ± 490 g; 1990–5190 g compared with 3429 ± 470 g; 1860–4950 g; $P < .001$). Multivariable analysis showed that black women were twice as likely to deliver with intact perineums than white women ($P < .001$).

Conclusion—Black primiparas were less likely to deliver with second-degree or greater lacerations and more likely to deliver with their perineums intact.

Vaginal delivery can cause vaginal and perineal lacerations, and in the long term, urinary and fecal incontinence and pelvic organ prolapse.^{1–6} There are reports of black women being less likely to have vaginal lacerations and pelvic organ prolapses, although there are no studies that have examined those issues.^{7,8} Racial differences in urinary incontinence have been reported. Black women have lower reported prevalence of urinary incontinence and appear to be less often diagnosed with stress urinary incontinence.^{2,9–11} There are differences in the continence control system that might explain those prevalence differences.¹² Trauma at vaginal delivery is the major risk factor for pelvic organ prolapse and incontinence.¹³ Vaginal lacerations are one measure of that trauma. The purpose of this study was to test the null hypothesis that there would be no difference in vaginal laceration rates between black and white primiparas.

Methods

After institutional review board approval, delivery records from the University of Michigan were reviewed retrospectively from July 1996 to December 1998. There were 7222 women who delivered during the study period, attended by nurse-midwives, obstetrician-gynecologists, and family physicians. Physician group deliveries were attended by residents

Address reprint requests to: Denise Howard, MD, MPH, University of Michigan, Department of Obstetrics and Gynecology, 1500 East Medical Center Drive, L4000 Women's Hospital, Box 0276, Ann Arbor, MI 48109-0276, E-mail: denhow@umich.edu.

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and supervised by attending physicians. Nurses completed delivery records at delivery with confirmation by attending physicians or nurse-midwives, who are required to sign the record to confirm its accuracy. Inaccuracies in records were possible, but infrequent and random, likely eliminating reporting bias that might affect statistical outcomes.

Women were included if this was their first vaginal delivery (including successful vaginal delivery after cesarean), they were at least 18 years old, and had gestation of at least 35 weeks. Once identified, demographic characteristics, including information on their reported race, were evaluated. Those who identified themselves as black or white were included in the final analysis.

Data were recorded regarding any vaginal or perineal lacerations and episiotomies. Delivery records reported episiotomy separately from lacerations. A first-degree laceration included the mucosa but not the underlying fascia. Second-degree lacerations included the mucosa and underlying fascia but not the anal sphincter. Third-degree lacerations involved the anal sphincter, and fourth-degree lacerations extended through the rectal mucosa. Episiotomies or second-degree lacerations were recorded as they happened. In certain instances, women had episiotomies and second-degree lacerations; these were reported in both categories. Length of second stage of labor was also included, which was the time from complete dilation to delivery. Intrapartum oxytocin, anesthesia, type of vaginal delivery, infant birth weight, and gestational age were also documented.

Data were analyzed with χ^2 analysis for nominal variables and unpaired *t* test for continuous variables, using the StatView statistical package (Abacus Concepts, Inc., Berkeley, CA). Logistic regression was used for multivariable analysis with SPSS 9.0 statistical package (SPSS Inc., Chicago, IL). Statistical significance was $P \leq .05$.

To compare laceration outcomes, we grouped them as first-degree or no laceration (because first-degree lacerations do not injure pelvic support tissues) (group 1) and second-, third-, or fourth-degree lacerations (group 2). Multivariable analysis was used to analyze perineal outcomes by grouping them into an “intact perineum” category and a “disrupted perineum” category. Women who had disrupted perineums had either second-, third-, or fourth-degree lacerations or episiotomies. Those with intact perineums did not need episiotomies and had first-degree or no laceration. We used that grouping to eliminate issues related to episiotomy grouping and questions about reasons episiotomies might have been done.

Results

One thousand eight hundred nine women met study criteria, and 176 were black and 1633 white. Data points were missing for specific variables, amounting to 2% or less for each group. Black women were on average 4 years younger, their infants weighed 137 g less, and they had second stages of labor that were 33 minutes shorter than those of white women (Table 1). There were no significant differences between groups in gestational ages at delivery, epidural or oxytocin use, or instrument delivery.

The differences between laceration rates and episiotomy frequency were statistically significant. Forty-three percent of black women had second-, third-, or fourth-degree lacerations compared with 59% of white women ($P < .001$). Table 2 shows the number of women in each group of laceration severity. The episiotomy rate for black women was 26.9%, whereas the rate was 37.9% for white women ($P = .003$).

Regression analysis was used to identify independent contributors to reported differences. Independent predictors of laceration rate were race, age, and birth weight. Using logistic regression with “intact perineum” as the outcome, we found that race, age, and birth weight

continued to be independent predictors of perineal status (Table 3). Black women were twice as likely to deliver with intact perineums ($P < .001$). An incremental increase in risk of perineal disruption was noted for age and infant birth weight in both groups. For each 1-year increase in age, women were 6% more likely to have disrupted perineums at delivery ($P < .001$), and for each 500-g increase in birth weight, women were 30% more likely to have disrupted perineums at delivery ($P < .001$).

Discussion

The findings of our study support anecdotal reports of lower vaginal laceration rates in black women. When the data were analyzed after grouping laceration severity and controlling for episiotomies, black women had a lower laceration rate. Black women in this study were younger, delivered infants who weighed less, and had a shorter second stage of labor than white women. After controlling for those factors, which might have affected laceration rate,^{14,15} race was still an independent predictor of perineal outcome.

Our findings support the reports of others: Robinson et al¹⁴ retrospectively studied epidural analgesia and third- and fourth-degree lacerations and found that black women were less likely to have those types of lacerations. Our study investigates that finding further by detailing second-degree lacerations.

Differences in laceration rates also were identified in other ethnic groups. Lydon-Rochelle et al¹⁵ reported lower risk of lacerations in Hispanic and Native American women than in non-Hispanic white women, when they examined perineal outcomes with nurse-midwife management. Others also found differences in length of second stage of labor among ethnic groups.^{16–18}

Biologic differences that are responsible for those different rates have not been determined. Magdi¹⁹ suggested that the “elastic index,” measured by the degree of abdominal striae, was predictive of perineal lacerations. Van Dongen⁸ speculated that different connective tissue makeup is important and that differences in collagen content of connective tissue might explain differences in prolapse prevalence in certain groups. Those hypotheses deserve further investigation.

Our findings support the idea of biologic differences between the races. The retrospective nature of our study prevents us from considering our findings as definitive proof of biologic differences, but they certainly provide enough information to warrant prospective comparative studies.

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Table 1

Demographics

	Black women (n = 176)	White women (n = 1633)	P
Age (y)	23.7 ± 4.7 (18–41)	27.8 ± 5.4 (18–49)	<.001
Gestational age (wk)	39.3 ± 1.6 (35–42)	39.5 ± 1.5 (35–43)	.16
Infant weight (g)	3292 ± 490 (1990–5190)	3429 ± 470 (1860–4950)	<.001
Second stage length (min)	73 ± 69 (3–494)	106 ± 78 (2–642)	<.001
Oxytocin	83 (47.2)	822 (50.3)	.42
Episiotomy			.003
Midline	39 (22.3)	565 (34.8)	
Mediolateral	8 (4.6)	51 (3.1)	
Delivery type			.35
Spontaneous	148 (84.1)	1297 (79.5)	
Vacuum	15 (8.5)	185 (11.3)	
Forceps	13 (7.4)	149 (9.1)	
Anesthesia			.16
Epidural	110 (62.5)	1116 (68.4)	
Pudendal	1 (0.6)	21 (1.3)	

Data are given as mean ± standard deviation (range) or *n* (%).

Table 2

Types of Lacerations

	Black women (n = 173)	White women (n = 1609)
No laceration	57 (33)	450 (28)
First degree	42 (24)	205 (13)
Second degree	56 (32)	634 (39)
Third degree	16 (9)	279 (17)
Fourth degree	2 (1)	41 (3)

Data are given as *n* (%).

Table 3

Predictors of Delivery With Intact Perineum

	Odds ratio*	95% CI	P
Age (y)	0.94	0.92, 0.96	<.001
Gestational age	1.04	0.95, 1.1	.40
Black race	2.1	1.5, 3.0	<.001
Second stage length	1.0	0.99, 1.0	.11
Epidural use	1.07	0.82, 1.4	.60
Pitocin use	1.04	0.82, 1.3	.74
Infant weight/500 g	0.69	0.59, 0.87	<.001
Forceps delivery	0.32	0.17, 0.60	<.001
Vacuum delivery	0.55	0.59, 0.80	.01

CI = confidence interval.

* The odds ratio indicates how likely an individual would deliver with an intact perineum given the presence of each listed variable.