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PREGNANCY OUTCOME OF MEXICAN-AMERICAN WOMEN: THE EFFECT OF GENERATIONAL RESIDENCE IN THE UNITED STATES

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Objective: To determine whether duration of generational residence in the United States is associated with the pregnancy outcome of Mexican Americans.

Design: This is a population-based study.

Methods: Stratified analyses were performed on a data set of 1989–1991 Illinois computerized vital records of Mexican-American infants.

Results: First generation ($N=2,203$) and second or higher ($N=4,192$) US-born Mexican-American women had infant low birth-weight rates of 7.5% and 6.1%, respectively, compared to 5.1% for Mexican-born women ($N=39,050$); relative risk=1.4 (1.2–1.7) and 1.2 (1.1–1.4), respectively. Among women with one or more high-risk sociodemographic characteristics (age less than 20 years, educational attainment less than 12 years, unmarried, high parity, or inadequate prenatal care), first generation ($N=1,624$) and second or higher generation ($N=2,874$) US-born Mexican-American women had infant low birth-weight rates of 8.3% and 6.5%, respectively, vs 5.2% for Mexican-born women ($N=33,625$); relative risk = 1.6 (95% confidence interval [CI], 1.3–1.9) and 1.2 (95% CI, 1.0–1.4), respectively. Among women with the lowest sociodemographic risk profile, infant low birth-weight rates did not vary between the subgroups.

Conclusions: For second or higher generation US-born Mexican-American women, the rate of infant low birth weight does not exceed that of first generation US-born women; it actually approximates that of Mexican-born women across a broad range of sociodemographic characteristics. (*Ethn Dis.* 2004;14:317–321.)

Key Words: Generational, Low Birth Weight, Mexican-American, Nativity

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INTRODUCTION

Since Mexican Americans are the second largest, and fastest growing, minority group in the United States, the pregnancy outcomes of US-born Mexican-American women is of particular public health significance.¹ It is well recognized that US-born Mexican-American women have a greater incidence of low birth-weight (LBW<2500 g) infants compared to Mexican-born women.^{2–4} Acculturation to a US lifestyle has been hypothesized to be a major reason for the nativity differential in pregnancy outcome among Mexican-American women.^{5–8} Supporting this conceptual model, Guendelman and English found that infants of Mexican-born women who lived in the United States for 5 years or more had a 50% greater LBW rate compared to infants of Mexican-born women who had lived in the United States less than 5 years.⁹ To the extent that adoption of a US cultural orientation singularly affects female reproductive health, one would expect second or higher generation US-born Mexican-American women to have a greater infant LBW rate than first generation US-born Mexican-American women. The relationship between duration of generational residence in the United States and Mexican-American pregnancy outcome is unknown.

Therefore, we analyzed Illinois vital

records to explore and compare the infant LBW rates of Mexican-born women, first generation US-born Mexican-American women, and second or higher generation US-born Mexican-American women.

METHODS

We obtained the computerized 1989–1991 Illinois birth certificates of singleton Mexican-American infants with Mexican-born mothers. These vital records contained a detailed maternal ethnicity variable that included separate codes for 'Mexican'; a separate maternal nativity variable also included separate codes for 'Mexico.' Mexican-born women were defined by the ethnicity (Mexican) and nativity/origin (Mexico) variables listed on their infant's birth record.

We created an Illinois trans-generational birth file; a detailed description of the data set has been published elsewhere.¹⁰ Briefly, the birth certificate data tapes for 1989–1991 from the Illinois Department of Public Health were linked to those of their mothers who were born in Illinois between 1956–1976. There were approximately 338,000 potentially matchable infants in the 1989–1991 cohort. On the basis of each mother's maiden name (first and last) and exact date of birth, we successfully linked 267,604 (79%) maternal birth records to infant records. Failure to match usually arose from minor spelling errors in the mother and infant records. Because of the unavailability of computerized vital records before 1956, the infant generation of the trans-generational birth file was limited to those

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*Acculturation to a US lifestyle has been hypothesized to be a major reason for the nativity differential in pregnancy outcome among Mexican-American women.*⁵⁻⁸

with mothers younger than 36 years of age. After the linkage of maternal and infant birth certificates was complete, all identifying information on the individual mothers and their infants was removed. Thus, the trans-generational data set was "de-identified" prior to the initiation of data analyses.

Mexican-American mothers in the trans-generational birth file had a slightly better sociodemographic profile than did US-born Mexican-American mothers of the 1991 population of Illinois births.¹⁰ For example, 14% of Mexican-American mothers in the trans-generational birth file were <18 years of age, compared with 18% of US-born Mexican-American mothers in the general population. In addition, 48% of Mexican-American mothers in the trans-generational birth file were unmarried, compared to 34% of US-born Mexican-American mothers in the general population.

First generation US-born Mexican-American women were defined by the "Mexican" ethnicity variable listed on

their infant's (1989-1991) birth record, and by the "non-United States" maternal nativity/origin variable listed on their birth record (1956-1975); their mothers were not born in the United States. Second or higher generation US-born Mexican-American women were defined by the "Mexican" ethnicity variable listed on their infant's (1989-1991) birth record, and by the "United States" or "Illinois" maternal nativity/origin variable listed on their birth record (1956-1975); their mothers were born in the United States.

We calculated the mean birth weight, low birth-weight (<2,500 g, LBW) rates, and very low birth weight (VLBW <1,500 g) rates for Mexican-American infants of: 1) Mexican-born women; 2) first generation US-born women; and 3) second or higher generation US-born women. The distribution of maternal age <20 years, educational attainment <12 years, unmarried marital status, parity of 4 or greater, and failure to initiate prenatal care in the first trimester, were determined for each subgroup. Low birth weight (LBW) rates were then calculated according to the level of sociodemographic characteristics. Because of the small number of VLBW infants among US-born mothers, we did not calculate generation-specific VLBW rates according to the level of sociodemographic characteristics.

High-risk maternal status was empirically defined as possession of one or more of the following characteristics: age <20 years, <12 years of formal education, unmarried marital status, or parity ≥4. Low-risk status was empiri-

cally defined as the absence of the above risk factors. The distribution of maternal risk status was determined for each subgroup. We then calculated infant LBW rates in high- and low-risk women.

The 95% confidence intervals (CI) for the relative risk (RR) were calculated by the Taylor series method.¹¹

RESULTS

Table 1 shows the infant birth-weight patterns of Mexican-born, first generation US-born, and second or higher generation US-born, Mexican-American women. First generation US-born Mexican-American women had the lowest infant mean birth weight, and the greatest rate of LBW and VLBW infants. Second generation or higher Mexican-American women had an infant birth-weight pattern similar to that of Mexican-born women.

Table 2 shows the distribution of selected sociodemographic and medical risk factors in the 3 sub-groups of Mexican-American women. The second or higher generation US-born women were the youngest, the most likely to be unmarried, and the least likely to be of high parity. The Mexican-born women surpassed both US-born groups with regards to possessing less than 12 years of formal education, and reaching high parity status. Eighty-six percent of Mexican-born women (N=33,625) were classified as high-risk (age <20 years, <12 years of formal education, unmarried marital status, or parity ≥4), as

Table 1. The birth-weight patterns of Mexican-American women; Illinois, 1989-1991

	Mexican-born (N=39,050)	First Generation US-Born (N=2,203)	Second or Higher Generation US-born (N=4,192)	RR1 (95% CI)	RR2 (95% CI)
Mean birth weight (g)	3371	3328	3341		
% <2500 g	5.1	7.5	6.1	1.4 (1.2-1.7)	1.2 (1.1-1.4)
% < 1500 g	1.0	1.9	1.0	1.9 (1.4-2.6)	1.0 (0.7-1.4)

RR1=First generation US-born compared to the Mexican-born; RR2=Second or higher generation US-born compared to Mexican-born.

Table 2. Distribution of selected sociodemographic and medical risk factors among Mexican-American women; Illinois, 1989–1991

Variable	Mexican-born (N=39,050)	First Generation US-born (N=2,203)	Second or Higher Generation US-born (N=4,192) Percent
Maternal age <20 years	12*	28	32
Maternal education <12 years	71*	45	38
Unmarried	28*	51	46
High parity†	12	10	6
Inadequate prenatal care‡	37	36	30

* P<.01 (Mexican-born compared to first generation US-born and second or higher generation US-born).

† Defined as 4 or more.

‡ Defined as none or initiated after the first trimester.

compared to 73% of first generation US-born Mexican-American women (N=1,624), and 69% of second or higher generation US-born Mexican-American women (N=2,870).

To gain more insight into the rela-

tive importance of the traditional risk factors in the 3 groups, we performed stratified analyses of infant LBW rates according to the level of each maternal risk factor (Table 3). The differential in LBW rates between infants of first gen-

eration US-born Mexican-American mothers and Mexican-born mothers widened as maternal risk status rose. This trend was most dramatic with respect to maternal parity: infants born to first generation US-born mothers of high parity had a LBW rate of 14.6%, compared to 6.2% for infants of Mexican-born mothers; RR=2.6 (1.9–3.7). In contrast, the LBW rates of infants of second or higher generation US-born Mexican-American women tended to approximate that of infants of Mexican-born women across the entire range of sociodemographic characteristics. High-risk, second or higher generation US-born Mexican-American women had an infant LBW rate equivalent to that of high-risk, Mexican-born women; RR=1.2 (1.0–1.4). Among women with the lowest risk profile—those 20–35 years of age who were married, had

Table 3. Low birth-weight rates by selected sociodemographic and medical risk factors among Mexican Americans; Illinois, 1989–1991

Variable	Mexican-born (N=39,050)	First Generation US-born (N=2,203)	Second or Higher Generation US-born (N=4,192) Per 100	RR1 (95% CI)	RR2 (95% CI)
Maternal age (years)					
<20	6.8	9.6	6.4	1.4 (1.1–1.8)	0.9 (0.8–1.2)
20–35	4.7	6.7	5.9	1.4 (1.2–1.7)	1.2 (1.0–1.5)
Maternal education (years)					
<12	5.2	9.0	6.6	1.8 (1.5–2.2)	1.3 (1.1–1.6)
12	4.9	6.4	5.6	1.3 (1.0–1.7)	1.1 (0.4–1.4)
>12	4.3	5.7	5.9	1.4 (0.9–2.1)	1.4 (1.0–1.4)
Marital status					
Unmarried	6.5	9.6	7.0	1.4 (1.2–1.7)	1.1 (0.9–1.3)
Married	4.5	5.3	5.2	1.2 (0.9–1.5)	1.2 (1.0–1.4)
Parity*					
High	5.5	14.6	6.4	2.6 (1.9–3.7)	1.1 (0.7–1.9)
Low	4.6	6.6	6.3	1.4 (1.1–1.7)	1.4 (1.2–1.6)
Primiparous	5.6	7.0	6.3	1.3 (1.0–1.7)	1.0 (0.8–1.2)
Prenatal care†					
Inadequate	5.1	8.4	5.9	1.6 (1.3–2.1)	1.2 (0.9–4.1)
Adequate	5.0	6.9	6.1	1.4 (1.1–1.7)	1.2 (1.0–1.4)
Risk status‡					
High	5.2	8.3	6.5	1.6 (1.3–1.9)	1.2 (1.0–1.4)
Low	4.1	5.2	5.2	1.3 (0.9–1.9)	1.3 (1.0–1.7)

RR1=First generation US-born compared to the Mexican-born; RR2=Second or higher generation US-born compared to Mexican-born.

* High defined as 4 or more. Low defined as 1–3.

† Inadequate defined as none or initiated after the first trimester; otherwise defined as adequate.

‡ Low defined as absence of all risk factors. High defined as 1 or more of the following: age <20 years, education <12 years, high parity, inadequate prenatal care.

... we found that first generation US-born Mexican-American women have a greater rate of LBW infants than do Mexican-born women.

at least 12 years of formal education, began their prenatal care in the first trimester, and were of low parity—infant LBW rates did not vary between the 3 groups (4.1% for Mexican-born, 5.2% for first generation and second or higher generation US-born women); RR=1.3 (0.9–1.9) and 1.3 (1.0–1.7) for first generation US-born and second or higher generation US-born (compared to Mexican-born) Mexican-American women, respectively.

DISCUSSION

The present population-based study provides new information on the pregnancy outcome of Mexican-American women. As expected, we found that first generation US-born Mexican-American women have a greater rate of LBW infants than do Mexican-born women. Our stratified analyses show that this disparity is widest among women with a high-risk sociodemographic profile. Most striking, the infant LBW rate of second or higher generation US-born Mexican-American women does not exceed that of first generation US-born women; it actually approximates that of Mexican-born women across a broad range of sociodemographic characteristics.

Confirming prior studies,²⁻⁸ our data show that infants of Mexican-born women have a favorable birth-weight distribution. Moreover, Mexican-born women are resilient to the effects of tra-

ditional risk factors for low birth weight, such as young age, limited educational attainment, high parity, and inadequate prenatal care. This epidemiologic paradox abates after one generation of residence in the United States. Similar to the phenomenon observed in established US-born populations, the incidence of LBW among infants of first generation US-born Mexican-American women rises as their individual risk status deteriorates.

An extensive literature suggests that acculturation to a US lifestyle is a risk factor for poor pregnancy outcome among Mexican-American women.^{5-6,12} An explanation for this phenomenon is the loss of a traditional Mexican cultural orientation, which leads to an unhealthier diet, higher rates of tobacco use, and decreased social support. However, to our knowledge, no published study has categorized US-born Mexican Americans according to duration of generational residence in the United States. Since one would expect a higher level of “unhealthy” behaviors among high-risk, second or higher (compared to first) generation US-born Mexican-American women, their lower rate of LBW infants provides evidence that acculturation to US lifestyle is a risk factor for infant LBW only among first generation US-born mothers. Alternatively, it may signify that Mexican-American women’s integration into American society reverses the impact of the loss of a Mexican cultural orientation on reproductive outcome. For Mexican Americans, similar to European Americans, duration of generational residence in the United States may be a proxy of assimilation into American society. Further research is warranted to determine whether second or higher US-born Mexican-American women retain a Mexican cultural orientation, suffer less acculturation stress, reside in integrated neighborhoods, and experience fewer episodes of interpersonal ethnic-group discrimination, compared to first generation US-born Mexican-American women.

The present study has implications for the Healthy People 2010 goal of eliminating ethnic group disparities in infant mortality rates.¹³ The lumping of Mexican-American women into a single category masks important health risks that differ between subgroups. Women’s birth in Mexico, or something closely related to it, is a protective factor for successful reproductive outcome. Our data suggest that targeted interventions should be aimed at first generation US-born Mexican-American women.

Although our study uniquely describes the pregnancy outcome of second or higher generation US-born Mexican-American women, it has a number of limitations. First, Illinois vital records lack information on duration of Mexican-born women’s residence in the United States. This has relevance to the pregnancy outcome of Mexican-born women.⁹ Second, because the study population was derived from 2 separate data sets we were unable to mathematically model infant birth weight and maternal nativity. This does not weaken the finding that, across a wide range of sociodemographic and biomedical characteristics, LBW rates did not increase concurrently with duration of generational residence in the United States. However, it reduces our ability to determine whether the measured risk factors account for the similar LBW rates of second or higher generation US-born Mexican-American and Mexican-born women. Third, we grouped all second or higher generation US-born Mexican-American women into a single category; this arbitrary lumping may have masked reproductive differences among third or higher generation US-born Mexican-American women. Fourth, because of the lack of computerized birth certificates prior to 1956, the analyses were restricted to women less than 36 years of age. This hampered our ability to examine the impact of aging on reproductive health within the study cohorts. Lastly, there was a built-in selection bias in creating the trans-generational birth

file. Infants for whom maternal matches were unsuccessful were slightly more likely to be of lower socioeconomic status, and therefore, more prone to low birth weight.¹⁰ As such, unmatched infants represent a minor concern to the validity of the LBW rate estimates among US-born Mexican-American women in the trans-generational birth file. The lack of disparity in infant LBW rates among low-risk, first generation US-born Mexican-American and Mexican-born women suggests that a geographically stable immigrant population, as evidenced by the ability to perform a trans-generational linkage, may be a more powerful predictor of pregnancy outcome than traditional risk factors.

In summary, second or higher generation US-born Mexican-American women do not have a greater infant LBW rate than that of Mexican-born women.

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