

Maternal Factors and Low Birthweight Infants: A Comparison of Blacks With Mexican-Americans

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Regional vital statistics suggest that the Mexican-American population, in spite of low socioeconomic status, has an infant mortality that is very similar to whites. American blacks of similar socioeconomic status have rates that are almost double that of whites. Part of this discrepancy can be explained by lifestyles, maternal behavior, lack of access to health care, and poor nutrition.

The study reported here compared the most potent predictor of infant mortality—low birthweight—among low-income black and Mexican-American infants born at Cook County Hospital. The incidence of low birthweight was 16.6 percent for blacks and 5.9 percent for Mexican-Americans, suggesting that the latter group enjoys some sociocultural protection from the effects of urban poverty in the United States.

Further efforts to reduce the infant mortality rate in the inner city should be directed at preserving those sociocultural traits that improve pregnancy outcomes and changing those social and economic factors that cause and promote unhealthy maternal behavior.

No statistic expresses more eloquently the difference between a society of sufficiency and a society of deprivation than the infant mortality rate.¹ Perhaps it was Marx who first recognized this particular relationship between health and economics when he described, in 1867, the differences in infant mortality across registration districts in England, ranging from a low of 70 per 1,000 to a high of 250 per 1,000 in the most heavily industrialized areas of the country.

At that time the working class lived in terrible poverty, and it is likely that the concomitant poor nutrition, housing, and sanitation contributed to these differences.^{2,3} Even though the industrialized areas of the world no longer experience such high levels of infant mortality, class and racial differences still persist within wealthy countries, as do their effects on infant mortality.

In this century rising per capita income has not always led to improved infant survival. A possible explanation of this phenomenon is that in many developing countries the sudden acquisition of new wealth is not uniformly

distributed; as a result, much of the population does not benefit in spite of the increase in per capita income.^{1,4}

In the United States the interest in infant mortality and social conditions has focused prominently on the gap between the black and white populations. The death rate among black children under the age of 1 year in 1920 exceeded that of whites by as much as 80 percent; precisely the same disparity exists today.⁵ Standard measures of social class—such as income and education—may not entirely account for this disparity.

Although there is no national Hispanic infant mortality rate, data from Houston, Texas, suggest that despite harsh poverty, infant mortality among predominantly Mexican immigrants is at a level equal to that of whites and roughly one half that reported for blacks.⁶ It is possible that the low infant death rates among Hispanics represent an important exception to the economics-health relationship.

This article addresses some of the broader questions regarding the relationship of poverty, health, and culture to the incidence of low birthweight in black and Mexican-American populations. Although a proxy measure of infant mortality, low birthweight remains the most easily measured biological factor that influences infant mortality in industrialized nations.⁷

In the United States low birthweight infants now account for a relatively much greater proportion of infant deaths than in the past.⁸ At the turn of the century nearly

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TABLE 1. PERCENTAGE OF LOW BIRTHWEIGHT INFANTS BY RACIAL/ETHNIC GROUP

Racial/Ethnic Group	United States 1981	Chicago 1983	Kaiser California 1977
White	5.7	6.3	3.6
Black	12.7	14.6	7.7
Total Latinos	6.1	6.3	4.0
Mexican-Americans	5.6	3.5	—

two thirds of all infant deaths occurred in the postneonatal period, primarily from infectious diseases that are now readily controlled by antibiotics or prevented by public health measures. Whereas the infant mortality rate since 1900 has decreased from approximately 100 per 1,000 live births to 12 per 1,000 live births, the incidence of low birthweight infants has remained virtually unchanged.^{9,10}

The Institute of Medicine Committee on the Prevention of Low Birthweight has grouped several factors that are known to have an impact on birthweight into demographic, medical, behavioral, and health care risk categories.⁹ Because socioeconomic status, age, race, and access to health care have been documented as significant factors that influence low birthweight, one would expect a higher percentage of low birthweight infants among racial minority groups, as they are disproportionately represented among the lower income strata. In 1983 the incidence of low birthweight infants in Chicago among blacks was 14.4 percent, whereas it remained 6.6 percent for whites—a disparity that explains much of the difference in the infant mortality rates that exist both in Chicago and in the United States.¹¹ Much of this racial disparity in low birthweight infants can be attributed to various sociodemographic factors such as maternal age, education, and marital status, as well as inadequate prenatal care.¹² Furthermore, maternal behavioral conditions such as diet and the use of tobacco, alcohol, and drugs are known to contribute.¹³

Surprisingly, the incidence of low birthweight infants of Mexican-Americans in Chicago at 3.3 percent was the lowest of the three racial/ethnic groups, even though the Mexican-Americans share many of the same sociodemographic risks as blacks.¹¹

A recently published prospective study of 29,415 pregnancy outcomes of an employed, middle-class, multiethnic population enrolled in a health maintenance organization during 1974 to 1977 revealed even lower rates of low birthweight with whites at 3.6 percent, blacks at 7.7 percent, and Hispanics at 4.0 percent.¹⁴ This study confirmed the importance of social factors and accessible health care on pregnancy outcomes. Even though blacks showed the greatest absolute decrease in the low birth-

weight rate, the disparity between blacks and other racial/ethnic groups endured. The regional and national low birthweight rates reported in these studies are illustrated in Table 1.

As a result of this disparity among racial minority groups who are of similar socioeconomic status, an attempt was made to evaluate some of the behavioral, demographic, and medical characteristics of black and Mexican-American women who gave birth to live infants at Cook County Hospital during 1986.

METHODS

The infants in this study were all born at Cook County Hospital between January and April 1986. A total of 472 women, 236 black and 236 Mexican-American, who were present on the postpartum wards on the first or second postpartum day were interviewed. (Fewer than 1 percent of all mothers left the hospital before completing a 48-hour postpartum stay in 1986.) The study population was not a random sample, as all mothers who were present on the postpartum ward were interviewed during an every other morning interview schedule; however, the incidence of low birthweight for the two groups was similar to the yearly hospital incidence for each group. Foreign-born black women were excluded from the study, as were women from Hispanic and racial/ethnic backgrounds other than Mexican-American. Of those Hispanics participating in the study, 210 were Mexican born and 26 were United States born. Only single births were included for the birthweight analysis.

Black and Mexican-American mothers were placed into one of three groups depending on whether they had (1) one or more of five previous, preexisting, or present medical-obstetrical complications of pregnancy; (2) one or more of six behavioral complications; or (3) the absence of both medical-obstetrical and behavioral conditions.

The following five medical-obstetrical complications, excluding parity, were defined by the Institute of Medicine as having a significant impact on birth outcome:

1. Presence of a chronic disease such as hypertension or diabetes
2. Toxemia or preeclampsia during present pregnancy
3. Previous low birthweight infant
4. Previous infant mortality
5. Previous stillborn

The six behavioral conditions included the following:

1. Aged less than 17 years or greater than 35 years at the time of delivery

TABLE 2. CHARACTERISTICS OF BLACK AND MEXICAN-AMERICAN MOTHERS

Variable	Black (%)	Mexican-American (%)	P value
Sociodemographic			
Mean age	22.1 years	24 years	<.001
Married	15.7	69	<.0001
Education	11.6 years	7.1 years	<.0001
Average monthly income	\$503	\$521	NS
Received welfare	37	10.4	<.0001
Received food stamps	30	11.6	<.0001
Received WIC*	55	56	NS
Employed	16	6	<.001
Father of child employed	40	53	<.01
Behavioral			
Younger than 17 years	8.9	5	<.05
Older than 34 years	2.5	3.7	NS
Smoked during pregnancy	32.8	5.8	<.0001
Regular alcohol use	5.1	2.9	NS
Drug abuse	6.4	1.3	<.01
Weight gain < 15 lb	12	6	<.05
Medical			
Presence of chronic disease	3.4	5	NS
Preeclamptic/toxemic	11.4	4.6	<.01
Previous low birthweight infant	8.5	12.6	NS
Previous stillborn	6.8	13.3	<.05
Previous infant death	2.1	8.8	<.05
Parity (0 or more than 4)	59.1	63	NS
Psychosocial			
Breast feeding	20.3	49.8	<.0001
Pregnancy planned	17.5	46.8	<.0001
Family support during pregnancy	83.8	59.2	<.0001

* WIC, Women and Infant Children food supplement program

2. Any tobacco use
3. Regular alcohol use
4. Drug abuse
5. No prenatal care or first prenatal visit in last trimester
6. Weight gain of less than 15 lb

Each of the six behavioral factors are related in that each is subject to some degree of maternal choice.⁹

A questionnaire of 47 items was administered by one of the authors (P.T.D) and a group composed of four family practice residents and three senior medical students. Individuals who administered the questionnaire to the Mexican-American women were fully bilingual. Participation in the study was optional, yet all mothers elected to participate. The study was approved in advance by the Scientific Committee of the Medical Staff of Cook County Hospital.

Information on birthweight, gestational age as determined by last menstrual period, type of delivery and complications, and medical conditions predating and during the pregnancy was obtained by reviewing the med-

ical record at the time of the interview. All other information, including income, was self-reported.

Statistical analysis was limited to descriptive and comparative measures using the chi-square and Student's *t* test available through the MIDAS system at the University of Michigan School of Public Health.

RESULTS

The incidence of low birthweight infants in this study was 16.1 percent (38/236) for blacks and 5.9 percent (14/236) for Mexican-Americans, a difference that was significant ($P < 0.01$). The incidence of preterm delivery (gestational age less than 37 completed weeks) was 16.6 percent in blacks and 13.3 percent in Mexican-Americans. This difference was not significant.

Significant differences exist between the two groups with respect to sociodemographic, behavioral, medical, and psychosocial variables (Table 2). Mexican-American

TABLE 3. INCIDENCE OF COMPLICATIONS IN BLACKS AND MEXICAN-AMERICANS

Complication	Percent With Complication		P value	Chi-square
	Black	Mexican-American		
One or more behavioral; no medical	33.5	17.4	.0001	15.298
One or more medical; no behavioral	10.2	18.6	.013	6.202
Both medical and behavioral	14.8	5.5	.0014	10.228
No medical; no behavioral	41.5	58.5	.0003	12.890

TABLE 4. INCIDENCE OF LOW BIRTHWEIGHT IN RELATIONSHIP TO PRESENCE OR ABSENCE OF COMPLICATIONS

Complication	Black Infants of Low Birthweight No. (%)	Mexican-American Infants of Low Birthweight No. (%)	P value	Chi-square
One or more behavioral; no medical	17/79 (21.5)	4/41 (9.8)	.17	1.836
One or more medical; no behavioral	3/24 (12.5)	7/44 (15.9)	.98	0.000
Both medical and behavioral	7/35 (20.0)	0/13 (0.0)	.19	1.650
No medical; no behavioral	11/98 (11.2)	3/138 (2.2)	.008	6.868

mothers tended to be older, married, less educated, and less likely to be recipients of welfare or food stamps during pregnancy than black mothers. Mexican-American fathers were more likely to be employed, but a higher percentage of black mothers were employed outside the home. There was, however, no significant difference in income or in the percentage of mothers who received Women and Infant Children (WIC) assistance during pregnancy.

The behavioral variables reveal several areas of significant difference. More black mothers were younger than 17 years, but there was no significant difference in the percentage of mothers older than 34 years at the time of delivery. Further, a higher percentage of black mothers smoked and used nonmedical drugs during the pregnancy than did their Mexican-American counterparts. Lastly, a higher percentage of black mothers gained less than 15 lb during the pregnancy.

In terms of medical-obstetrical variables, there were no significant differences between those with a chronic disease or those with a previous low birthweight infant. Mexican-American mothers were more likely to have had a previous infant death or stillborn; however, the medical complication rate for Mexican-Americans might be inflated by confusion over the Spanish word used for stillborn (*aborto*). Many miscarriages and induced abortions might have been reported as stillbirths, as there are no separate words in Spanish to indicate either miscarriage or stillborn. Finally, black mothers were more likely to suffer from preeclampsia and toxemia.

The psychosocial variables in Table 2 reveal the most consistent differences ($P < .0001$) between the two pop-

ulations. More black mothers reported increased family support during the pregnancy, but more Mexican-American mothers reported that the pregnancy was planned or that they were breast feeding.

When considering the incidence of complications, 33.5 percent of black mothers and 17.4 percent of Mexican-American mothers had at least one behavioral condition and no medical complication (Table 3). When the low birthweight rate in these subsets was compared (Table 4), the difference was not significant ($P = .17$). In the groups with one medical and no behavioral complications, the low birthweight rate was almost identical. When both complications were present, in 14.8 percent of blacks and 5.5 percent of Mexican-Americans, the low birthweight rate difference again was not significant ($P = .19$). When no complications were present, both groups had a lower percentage of low birthweight than overall means, but the low birthweight rate among Mexican-Americans was still significantly lower ($P = .008$).

DISCUSSION

The data presented illustrate some rather striking differences in both the incidence of low birthweight infants and the presence or absence of various behavioral, demographic, and medical conditions between poor black and Mexican-American women.

When one controls for behavioral or both behavioral and medical complications, Mexican-Americans have a lower incidence of low birthweight infants. These differ-

ences may have been significant if the sample size had been larger. When neither complication is present, Mexican-Americans, despite their poverty, cultural displacement, and language barriers, have a low birthweight rate of 2.2 percent, which is among the most favorable in the world. Blacks without complications still have a low birthweight rate of 11.2 percent. The most likely explanation is that some significant determinants of low birthweight in the sample studied are not being measured. These determinants could be related to family structure.¹⁵ Future studies utilizing objective measures of family structure and function, such as the Family Adaptability and Cohesive Evaluation Scale (FACES)^{16,17} and Family APGAR,¹⁸ may serve to document further the difference among ethnic groups.

Why should Mexican-Americans have better low birthweight rates? It is possible that some "protective sociocultural effect" exists that attenuates some of the negative factors that are linked to race, poverty, and pregnancy outcomes in the United States. If such a "protective effect" exists, it may be lost through acculturation. Such an effect on low birthweight has been reported between US-born and Puerto-Rican-born Hispanics.¹⁹ Future research looking at the characteristics of acculturation (length of time in the United States, language preference, motivation for immigrating, etc), and the length and degree of poverty in the United States may shed light on why certain groups have better low birthweight rates.

One possible explanation is that a select group of Mexicans are currently immigrating to the United States who are healthier or financially advantaged.²⁰ Such trends have been documented in England, where immigrant groups have lower infant mortality rates than native Britons in the same social class.²¹ In this study, however, such an explanation is unlikely, as from the authors' experience and from the income and education levels reported here, in concert with the data in Table 2, the most recent Mexican immigrants to the United States, especially those who use Cook County Hospital, are in general an adversely selected, impoverished group from small towns who came to the United States (*el norte*) in search of employment. Hence, there are no direct data to support the hypothesis that recent Mexican-American immigrants are selected for more favorable outcomes.

Although this study compares two urban minority group populations of similar socioeconomic status, they are actually quite dissimilar from a cultural perspective. The black population studied shares many of the same behavioral and demographic characteristics prevalent among other low-income urban blacks and whites.¹² The Mexican-American population studied here is poor but not culturally urban. Rather, they are representative of individuals who were raised in a rural, somewhat preindustrial, social milieu.²² This group is more similar to

other impoverished immigrant groups who come to Chicago than they are to urban inner-city populations in the United States. For this latter group, their cultural patterns and lifestyles have been altered as a result of chronic poverty, unemployment, and racism. In such a milieu there is no "protective effect" against poverty, and as such, their low socioeconomic status is especially hazardous to pregnancy and the health of infants.

Mexican-Americans should be supported in their attempts to maintain those sociocultural attributes that are conducive to healthy infants. For lower income urban blacks and for poor whites, as Miller et al have documented,³ the solution for unhealthy pregnancy outcomes is not to blame the victim, but, rather, to condemn and change those economic and political factors that are responsible for the unhealthy lifestyles. For these individuals poverty remains "the mother of disease." Improved education, job opportunities, and incomes are much more likely to improve infant outcomes in inner-city populations than further advances in medical technology.

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