Maternal Acculturation and Childhood Immunization Levels among Children in Latino Families in Los Angeles

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ABSTRACT

Objectives. This study examined the relationship between acculturation levels of poor Latina women in Los Angeles and their children's immunization status. Receipt of three doses of diphtheria-tetanus-pertussis vaccine and two doses of oral polio vaccine by the age of 12 months was considered adequate immunization.

Methods. Household interviews were conducted in East Los Angeles and South Central Los Angeles with mothers (n = 688) about one randomly selected child aged 12 to 36 months.

Results. One fourth of the children were inadequately immunized. Less-acculturated mothers were more likely to have adequately immunized children. Inadequate prenatal care, absence of close family members, the child's birth position as other than firstborn, and more than one family relocation during the child's lifetime were associated with inadequate immunization.

Conclusions. The findings challenge the notion that children of recent immigrants bear a higher risk of underimmunization. (*Am J Public Health.* 1997;87:2018–2021)

Introduction

Recent epidemiological evidence has shown that Latino children living in poor, urban areas risk underimmunization.[1] Both in Los Angeles and across the nation, the 1989 to 1991 measles epidemic was mostly found among ethnic-minority preschool children living in inner-city neighborhoods. The Centers for Disease Control and Prevention attributed the epidemic, which claimed an estimated 55 000 cases, 11 000 hospitalizations, and 130 deaths, primarily to a failure to vaccinate children by their second birthday.[2] Children younger than 5 years of age accounted for 61% of the cases in Los Angeles in 1990.[3] Among US cases, measles attack rates among Latino children were six times those among Anglo children.[4]

Several studies have sought to explain the differences in immunization coverage rates among children of various backgrounds.[5] For example, socioeconomic indicators such as mother's level of education, mother's marital status, parental age, and parents' employment status have been associated with use of immunization.[6–9] However, even in the absence of financial barriers to immunization services, many families fail to immunize their children.[10,11] Behavioral factors affecting the use of child immunization services are complex; cultural and ethnographic influences are poorly understood.[12]

Among Latinos in the United States, acculturation—the extent to which Anglo-American cultural beliefs and behaviors are adopted and traditional culture is retained—varies widely.[13] Assessing the degree of acculturation of Latina mothers and the association of acculturation with the use of childhood immunizations may help determine which health behaviors are socially learned.[14–18]

In the present study we investigate how maternal acculturation influences the decision to immunize young children in Latino families, primarily those of Mexican ethnicity, residing in Los Angeles. We focus on the relationship between the degree of maternal acculturation and adequacy of childhood immunizations by 12 months of age, considering the effect of maternal social support and other covariates known to be associated with immunization use.

Methods

Target Population

We targeted Latino families with children between 12 and 36 months of age who resided in the Los Angeles neighborhoods with the highest measles attack rates during the 1989 to 1991 epidemic. The data presented here were collected from household interviews in three inner-city Los Angeles County public health districts between August and December 1992. We used cluster sampling similar to that used in the World Health Organization's Expanded Program on Immunizations.[19] Census blocks served as the primary sampling unit; we obtained a moderate cluster size of three households from each primary sampling unit. Using the 1990 US Census Summary Tape File 1B, we sampled census blocks in such a manner that the probability of choosing a particular household was proportional to the predicted number of eligible households in the block.

The Northeast and East Los Angeles health districts are contiguous areas that together encompass 36 census tracts and had a combined 1990 population of 179 891. According to that year's census,

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84% of the population were Latino; of these, 4.6% were children 1 or 2 years of age. The South Central Los Angeles health district has 55 census tracts and, in 1990, had a population of 292 377, with Latinos and Blacks each accounting for about 40% of the population. In the Latino population in South Central Los Angeles, 5.6% were children aged 1 or 2.

Survey Instrument

The survey instrument covered factors related to family structure, demographic characteristics, health insurance coverage and care utilization patterns, and health and immunization status among children from 12 to 36 months of age. During the household interview, our interviewers asked respondents to show them the child's immunization record or shot card, which included the date of vaccination for each antigen received. The Advisory Committee on Immunization Practices recommends that a child receive three doses of the combined diphtheria-tetanus-pertussis vaccine and two doses of oral polio vaccine by 12 months of age.[20] We defined adequacy of immunization as receipt of all three doses of the diphtheria-tetanus-pertussis vaccine and of both doses of the oral polio vaccine by 12 months of age, regardless of whether the children had received the immunizations at the recommended intervals.

Acculturation Scale

Some Latino families have lived in Los Angeles for many generations, but many are recent immigrants. To measure the expected cultural diversity among Latinos within the Los Angeles communities studied, we included an acculturation scale based on Cuellar's work.[21] This scale, which has been used extensively in federal surveys of the health of Hispanics in the United States, examines language use, ethnic identity, and generational status.[22,23]

Data Analysis

In the bivariate analysis we used the chi-square to examine associations between categorical variables and the child's immunization status at 12 months of age. Multivariate analyses were performed with logistic regression; our model included variables from the bivariate analysis that were associated with immunization status at $P < .10$. Stata software provided standard errors that took into account the combined effects of clustering, stratification, and unequal selection probabilities in the sample design.[24]

Results

We conducted 817 interviews in Latino households in East Los Angeles and South Central Los Angeles. Ninety-four percent of the respondents were the child's mother. Because our study focused on maternal acculturation, we excluded from analysis the 50 interviews conducted with respondents other than the mother. In most cases we ascertained immunization status from written records in the home. In 79 cases we could not verify the immunization from either the immunization card or the medical record; these cases were also excluded from the analysis. The final sample for analysis consisted of 688 mothers and 688 children.

In all, a quarter of the 688 children in the sample were inadequately immunized at 12 months of age. A larger proportion of the children residing in South Central Los Angeles were inadequately immunized compared with those in East Los Angeles (30% vs 18%). Most of the mothers interviewed were born in Mexico (76%) and spoke Spanish predominantly (75%). Although most mothers were currently married or with a partner, there were few close family networks, with most women reporting two or fewer close relatives. The absence of friends was even more notable; almost 40% of the women reported no close friends.

The eight-item acculturation measure, which assessed language preference, ethnic background, and ethnic identification, demonstrated high internal reliability (Cronbach alpha = .93) in our household sample of Los Angeles Latina women. The distribution of acculturation scores for East Los Angeles and South Central Los Angeles was similar: although the possible score range was 1 to 5, more than half of the sample scored 1, signifying less acculturation.

Table 1 presents estimated odds ratios (ORs) with 95% confidence intervals (CIs) for selected variables found to be associated ($P < .10$) in the bivariate analysis with immunization status at 12 months of age, as calculated by our logistic regression model.

Maternal acculturation was associated with immunization status: those mothers who were *less* acculturated (i.e., who scored 1 on the acculturation scale) were more likely to have better immunized children. With each point increase in the acculturation score of the mother, the odds for inadequate immunization increased by a factor of 1.31 (95% CI = 1.07, 1.62). Inadequacy of the mother's prenatal care was associated with a fourfold increase in the subsequent risk of the child's being inadequately immunized (OR = 4.21; 95% CI = 2.16, 8.21). Compared with mothers who reported one or more close family members present, those who reported none had a child almost twice as likely to be poorly immunized (OR = 1.97; 95% CI = 1.18, 3.29).

Consistent with previous research, sibling position was found to be associated with inadequate immunization status, with those other than the firstborn having 1.4 times the chance of missing one or more vaccines (95% CI = 1.15, 1.70). The mother's assessment of a child's health status as poor compared with that of other children was associated with a twofold increase in the risk of inadequate immunization.

If a family moved at least once during the child's lifetime, the child was more likely to be underimmunized (OR = 1.64; 95% CI = 1.06, 2.52). Adjusted family income did not predict immunization status; the majority of families in the study were poor. Families who resided in South Central Los Angeles were almost twice as likely as those in East Los Angeles to have inadequately immunized children (OR = 1.96; 95% CI = 1.17, 3.30).

Interaction terms for immunization status and each covariate were not significant and were thus excluded from the final model. Neither the type of health insurance (private or public) nor the lack of health insurance (among a third of the sample) was associated with immunization status in the multivariate analysis; the type of facility used for well-child care (private doctor's office, public clinic, or health maintenance organization/preferred provider organization) also was not associated. Consequently, these variables were not included in the final model.

Discussion

The less-acculturated mothers in our study had, on average, better-immunized children. There is evidence that in other circumstances as well, being less acculturated is tied to better health: better birth outcomes have consistently been found among Mexican-American women who were foreign born compared with those born in the United States.[25–27] One explanation for this paradoxical finding is that the social and familial structures within the Mexican culture are more supportive.[28–30] The women in our study were more likely to be housewives than to work outside the home, which may have contributed to their having more time to take the child to a facility for well-child care. Some research has suggested that full-time employment of the mother outside the household may decrease the chances of

TABLE 1—Estimated Odds Ratios (ORs) and 95% Confidence Intervals (CIs) for Inadequate Immunization Status at 12 Months of Age, According to Selected Characteristics (n = 639)

Effect	OR	95% CI
Child characteristics		
Sibling position (reference group: first born)	1.40	1.15, 1.70
Health rated poor by mother (yes vs no)	2.05	1.21, 3.50
Visits to doctor in a year (increments of 1)	0.96	0.92, 1.01
Maternal characteristics		
Acculturation score (reference score: 1)	1.31	1.07, 1.62
Education, y (< 8 vs 9+)	1.00	0.54, 1.88
Married (reference: yes)	1.46	0.63, 3.41
Adequate prenatal care (reference: yes)	4.21	2.16, 8.21
Pap test within 1 y (reference: yes)	0.96	0.60, 1.53
Social networks: close family members (reference: any)	1.97	1.18, 3.29
Incorrect belief that giving shots any time before kindergarten is acceptable (reference: no)	1.52	0.84, 2.74
Household characteristics		
Residential area (reference: East Los Angeles)	1.96	1.17, 3.30
Husband/partner employed (reference: yes)	0.84	0.38, 1.83
Family moves in child's lifetime (any vs none)	1.64	1.06, 2.52
Adjusted family income[a] (reference: <$1700)		
$1700–2699	1.48	0.79, 2.76
$2700–3699	1.18	0.57, 2.44
$3700–4699	1.23	0.51, 2.98
$4700–5600	0.63	0.18, 2.32
$5700 +	0.90	0.42, 1.95

Note. Goodness-of-fit test (percentiles of estimated probabilities): Hosmer-Lemeshow chi-square (df = 8) 13.47.
[a]Income per family member per year.

the child's being adequately immunized.[10]

Consistent with previous childhood immunization services research,[6–11] measures that suggest greater demands on family resources were associated in our study with inadequate immunization status. These measures included larger family size, more children under the age of 5, and the child not being the firstborn. In the population we studied and in other recent studies of childhood immunization use, health insurance coverage alone did not guarantee that a child would be adequately immunized.[10,11] Our finding that families reporting private health insurance, public coverage (such as Medi-Cal), and no health insurance had similar proportions of inadequately immunized children suggests that financial access to health services, while fundamental, must be accompanied by interventions to make it easier to obtain these services, particularly for families with many competing needs. Our finding that inadequacy of the mother's prenatal care predicted inadequate immunization status suggests a lack of opportunity for the health education and referral for follow-up newborn care (including immunizations) typically provided in prenatal visits.

In both East Los Angeles and South Central Los Angeles, the distributions of acculturation scores were surprisingly similar. We anticipated less acculturation in the South Central Los Angeles population, which was transformed from a predominantly Black neighborhood in 1980 to one with equal representation of Latinos and Blacks in 1990. In contrast, in East Los Angeles, a historically Mexican-American residential area, we expected acculturation scores to be generally higher. However, since inclusion in our study required the presence of young children in the household, those households with older, more acculturated, longtime residents of East Los Angeles may have been excluded. While there were more US-born Latina women in East Los Angeles than in South Central Los Angeles (19% vs 13%), we can only speculate that some of the highly acculturated, young Mexican-American families may have moved from the inner-city neighborhood of East Los Angeles to more economically advantaged residential areas.

Whereas recent immigrants dominated the sample populations for both East Los Angeles and South Central Los Angeles, the health care delivery systems in the communities differ. Spanish-speaking providers in both the private and public sectors are more common in East Los Angeles. This fact may partially explain the beneficial effect that residing in East Los Angeles had in our study. Although our study did not provide information on community structural variables, distressed social conditions may influence the use of community health and social services. South Central Los Angeles had experienced serious civil riots only a few months before we conducted the community survey.[31]

We conclude that although the Latino population in Los Angeles is heterogeneous, recent immigrants dominate the inner-city neighborhoods. The fact that Spanish is the predominant language among Latina mothers of young children in both East Los Angeles and South Central Los Angeles underscores the need for Spanish-speaking health service providers to inform families about child health as well as about the purpose and sequence of childhood immunizations. We stress the importance of improving the immunization status of these inner-city preschool children, a quarter of whom had not received the basic series of diphtheria-tetanus-pertussis and oral polio vaccine by 12 months of age. Our finding that greater acculturation is associated with poorer childhood immunization status challenges the notion that young children of the most recent immigrants have the highest risk of missed immunizations. However, the strength of our findings is limited by the small proportion of mothers in our sample who were highly acculturated. Thus, we encourage further research to clarify the impact of the acculturation effect. □

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