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Preferred spoken language mediates differences in neuraxial labor analgesia utilization among racial and ethnic groups

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ABSTRACT

Introduction: The aims of this study were to assess racial/ethnic disparities for neuraxial labor analgesia utilization and to determine if preferred spoken language mediates the association between race/ethnicity and neuraxial labor analgesia utilization.

Methods: We performed a retrospective cohort study of 3129 obstetric patients who underwent vaginal delivery at a tertiary care obstetric center. Bivariate analyses and multivariate logistic regression models were used to assess the relationships between race/ethnicity, preferred spoken language and neuraxial labor analgesia.

Results: Hispanic ethnicity (adjusted OR 0.77, 95% CI 0.61–0.98) and multiparity (adjusted OR 0.59, 95% CI 0.51–0.69) were independently associated with a reduced likelihood of neuraxial labor analgesia utilization. When preferred spoken language was controlled for, the effect of Hispanic ethnicity was no longer significant (adjusted OR 0.84, 95% CI 0.66–1.08) and only non-English preferred spoken language (adjusted OR 0.82, 95% CI 0.67–0.99) and multiparity (adjusted OR 0.59, 95% CI 0.51–0.69) were associated with a reduced likelihood of neuraxial labor analgesia utilization.

Conclusions: This study provides evidence that preferred spoken language mediates the relationship between Hispanic ethnicity and neuraxial labor analgesia utilization.

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Keywords: Disparities; Utilization; Race; Ethnicity; Neuraxial analgesia; Labor analgesia

Introduction

The availability and use of neuraxial techniques for the provision of labor analgesia has been increasing among USA hospitals with obstetric care facilities.^{1,2} However, important disparities are known to exist in the use of neuraxial labor analgesia among patients of different racial/ethnic groups.^{2–5} Based on birth certificate data from a nationwide sample of USA patients undergoing vaginal delivery, the rate of neuraxial labor analgesia among Hispanic women was found to be lower than that of Caucasian women (48% vs. 69%, respectively).² This healthcare disparity has important ramifications for the future delivery of high-quality obstetric anesthetic care, as a recent USA Census Bureau report indicated that more than half of the growth in the population between 2000 and 2010 (15.2 million of 27.3 million) was due to an increase in the Hispanic population.⁶

There is growing interest in leveraging health information technologies as tools for outcomes-based research with the goal of identifying and addressing

health disparities that affect racial/ethnic minorities and non-English speaking patients.^{7,8} Previous studies have suggested that racial/ethnic disparities persist even after adjusting for relevant clinical risk factors, socioeconomic factors and provider effects (based on insurance status).^{3–5} However, residual confounding is likely to have been an important limitation in these studies, with preferred spoken language in particular being notably absent from the models used to assess predictors for utilization of neuraxial analgesia. There is growing appreciation that language barriers can contribute to important healthcare disparities, with studies conducted in a non-obstetric setting reporting that patients with limited English proficiency had higher rates of adverse outcomes and reduced compliance with medical treatment compared with patients who are English-speaking.^{9,10} However, the impact of language proficiency on healthcare disparities in the labor and delivery setting is incompletely understood.

The aims of this study were to assess racial/ethnic disparities for neuraxial labor analgesia utilization and to determine if preferred spoken language mediates the association between race/ethnicity and neuraxial labor analgesia utilization in a multiethnic cohort of women who underwent vaginal delivery.

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Methods

This retrospective study was conducted at Lucile Packard Children's Hospital (LPCH) after approval by the Institutional Review Board (IRB) of Stanford University Medical Center; informed consent for this study was waived by the IRB. LPCH is a university hospital and tertiary obstetric center with approximately 5000 deliveries per year and has a level III neonatal intensive care unit. Patients who deliver at LPCH comprise a multiethnic cohort with low- and high-risk pregnancies. The labor and delivery unit provides obstetric care to patients with different payer or insurance coverage (insured, Medicaid, or self-pay). Obstetricians who provide obstetric care at LPCH are employed by private practice groups, Stanford University Medical Center, or the San Mateo County Health System. The obstetric anesthetic coverage is provided for all inpatients by a team of anesthesiologists based at Stanford University Medical Center (comprising of at least one dedicated anesthesia attending and one anesthesia resident) who are available in-hospital 24 h per day. Hospital intake workflow is the same for all patients, regardless of race, ethnicity, religion, sexual orientation or preferred spoken language.

Our study population consisted of patients who underwent vaginal delivery at LPCH from January 1, 2008 to December 31, 2008. To identify our cohort, we accessed an institutional electronic data warehouse that stores patient health information sourced from our institution's electronic medical records (Cerner Powerchart®, Cerner Corp., Kansas City, MO, USA). The year 2008 was chosen for the study because it was the first year that complete electronic records were available for research. We performed an electronic search of the data warehouse for patients who underwent vaginal delivery during the study period. Information about neuraxial labor analgesia, maternal age at the time of delivery, racial/ethnic group, parity, insurer/payer status and preferred spoken language were abstracted from electronic medical records. Clinical elements were abstracted from nursing and physician entries whereas insurance and demographic information was abstracted from administrative and clerical entries, respectively. We excluded patients who underwent a trial of labor before intrapartum cesarean delivery, as we were unable to clearly ascertain whether latent or active labor preceded cesarean delivery using search queries within the data warehouse. To verify data integrity and account for missing data, one of the authors (JC) manually reviewed the medical charts of 450 patients (14% of study cohort).

Women who received either epidural, combined spinal-epidural or single-shot spinal techniques for labor analgesia were defined as receiving neuraxial labor analgesia. For our primary dependent variable, we dichotomized patients into groups either receiving or not receiving neuraxial labor analgesia. Maternal race/

ethnicity and preferred spoken language were self-reported by patients at the time of inpatient admission to the labor and delivery unit and then entered manually by labor and delivery nurses into each patient's electronic medical record. We categorized race/ethnicity as non-Hispanic White, non-Hispanic Black, Hispanic, Asian/Pacific Islander (hereafter called Asian), and non-Hispanic Other in accordance with the Office of Management and Budget's Directive No. 15 (*Race and Ethnic Standards for Federal Statistics and Administrative Reporting*).¹¹ We initially examined the proportion of patients within each racial/ethnic group who spoke English, Spanish, and languages other than English or Spanish. We created a dichotomous variable for preferred spoken language (English or non-English) because the proportions of patients speaking languages other than English or Spanish were small (Whites, 5.3%; African-Americans, 0.03%; Hispanics, 0.4%; Asians, 3.8%; non-Hispanic Others, 0.2%). We categorized health insurance status as public insurance (comprising patients on Medi-Cal) or private insurance, aggregating all types of private insurance into a single group. Medi-Cal is California's Medicaid program that provides health insurance coverage for 19% of the non-elderly population, including 2.7 million adults.¹² After manual review of the medical records, 35 patients were excluded from the analysis because we could not clearly ascertain their health insurance status.

Statistical analysis

Frequency distribution, mean and standard deviation (SD) of maternal and obstetric characteristics were determined by race/ethnicity. We used the chi-squared test to compare independent categorical variables (preferred spoken language, insurance type, parity and utilization of neuraxial labor analgesia) by race/ethnicity. We performed one-way analysis of variance (ANOVA) to compare mean ages by race/ethnicity. The association between neuraxial labor analgesia and each of the explanatory variables was initially assessed using univariate logistic regression models. Crude odds ratios (OR) and 95% confidence intervals (CI) were calculated. The potential for collinearity (which refers to a linear relationship between two explanatory variables) was determined by calculating variance inflation factors. We did not detect evidence of collinearity as the variance inflation factors for each racial/ethnic group ranged from 1.0 to 2.3.

We incrementally constructed two full multivariable logistic regression models to assess the associations between race/ethnicity and neuraxial labor analgesia utilization. The OR for neuraxial labor analgesia utilization among Hispanics, non-Hispanic Blacks, Asians, and non-Hispanic Others were compared with non-Hispanic Whites (as the reference group) within each multivariate logistic regression model. The first model included only age, race/ethnicity, parity and insurance type. The

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