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Trauma care in a multiethnic population: effects of being undocumented

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ABSTRACT

Background: Epidemiologic studies have shown that undocumented immigrants (UIs) display characteristics of having a low socioeconomic status and are primarily of ethnic minorities. These social determinants of health are known to be associated with diminished health care access and poor clinical outcomes. We therefore investigated the impact of documentation status on the clinical outcomes of patients with traumatic injuries.

Materials and methods: We conducted a retrospective review of the trauma registry at our safety net institution for all adult patients who were admitted from 2010 to 2014. UIs were identified by the absence of a valid social security number within their medical records. Multivariate regression analysis was used to determine the impact of documentation status on in-hospital mortality, length of stay (LOS), and the odds of rehab placement.

Results: 4924 trauma patients met the study criteria, of which 1050 (21.3%) were UIs. There was no significant difference in mortality rates between the two populations. Multivariate regression analyses revealed a longer average LOS and a decreased likelihood for placement in an in-patient rehabilitation facility following hospitalization for UIs, even after accounting for insurance, age, injury severity, and other possible confounders known to affect these outcomes.

Conclusions: There was no association between in-hospital mortality and documentation status; however, UIs had a longer average LOS and were less likely to be placed into rehab following their hospitalization. A longer LOS and a decreased likelihood for rehabilitation placement suggest that disparities in trauma care exist for UIs, putting them at risk for worse clinical and functional outcomes.

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Introduction

Trauma, the fourth leading cause of death in the United States, is often simplified as an event requiring emergent and/or surgical treatment, but unfortunately, it can lead to debilitating problems requiring chronic care.¹ Although emergency departments provide care to all patients regardless of their

race/ethnicity or socioeconomic status (SES), disparities have been shown to exist in trauma care for those of ethnic minorities or of low SES.²⁻⁴ Nonprofit safety net health care institutions are dependent on public funding to subsidize care for populations of low SES, including care for traumatic injuries. Such care includes treatment for approximately 11.9 million undocumented immigrants (UIs) in the United States.^{5,6}

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Epidemiologic studies show that most UIs are of a low SES. They are more likely to be uninsured, have low incomes, and have less education.⁶⁻⁸ These social determinants of health are associated with diminished health care access and thus worse clinical outcomes in a variety of medical conditions.^{2,3,9-12}

Of the five boroughs that comprise New York City (NYC), Queens has been deemed the “borough of immigrants,” with more than one-third (~1 million) of the entire NYC foreign-born population within its neighborhoods, one-fourth of which who are undocumented.^{13,14} Elmhurst Hospital Center (EHC) is a public, level 1 trauma center in Queens, NYC, which treats a large UI population.¹⁵ Therefore, we were interested in exploring documentation status as a risk factor for disparities in trauma care.

Studies investigating the quality of care or clinical outcomes of UIs are scarce and primarily focus on UIs of Hispanic ethnicity and their utilization of the health care system.¹⁶⁻¹⁸ Studies that concentrate on UIs with traumatic injuries fail to analyze documentation status for all races and ethnicities—again focusing on Hispanic patients.⁵ Although most UIs in the United States are of Hispanic or Latino descent,⁵⁻⁸ 34% of the UIs residing in Queens are Asian, and 13% hail from countries other than Mexico and Central and South America.¹³ Our institution is known to treat this diverse patient population.^{15,19} Therefore, we hoped that reviewing our data on UIs of various ethnicities within the same socioeconomic environment would elucidate possible disparities in their trauma care.

Rehabilitation after traumatic injury allows patients to regain optimal function.⁴ UIs are known to hold jobs that require physical, manual labor, and obtaining optimal function is therefore imperative for the 74% of the UI population in the United States, who work in the labor force.^{6,20} Because UIs are more likely to be uninsured and have lower income, we hypothesized that the UI population seen in our hospital would be less likely to be discharged to an in-patient rehabilitation facility (IPR) and would have an increased in-hospital length of stay (LOS) in comparison to their documented counterparts.

Materials and methods

We conducted a retrospective review of the trauma registry at EHC, one of 11 NYC Health and Hospital Corporation safety net facilities that provides medical services to all patients, regardless of SES, insurance, or immigration status.^{15,19} With the approval of our institutions' IRB, the medical records for all adults (≥ 18 y), who were admitted from January 1, 2010 through December 31, 2014 were reviewed.

Immigration status was determined using previously accepted methodology.^{15,19} Patients lacking a valid social security number (SSN) were categorized as UIs, and those with a valid SSN were categorized as a documented US resident (DR). All social work notes in the medical records were reviewed for the UI population to ensure that those without an SSN truly lacked US documentation as recorded by hospital staff. Because NY State considers UIs that require treatment for an emergency medical condition or if permanently residing under color of law eligible for Medicaid,²¹ insurance status as a

means for identifying UIs was not used as in previous literature.^{5,22} UIs were considered insured if their application for emergency Medicaid was approved, and UIs whose applications were rejected remained uninsured for analysis. Race and ethnicity were determined through self-reported data from the medical records. Race/ethnicity was categorized as either Hispanic or non-Hispanic for total study population analyses and was further categorized as white, Asian, Hispanic, or other non-Hispanic (black, other, and unknown) for subgroup analysis.

UIs were compared to DRs, with documentation status as our predictive variable for in-hospital LOS, in-hospital mortality, and placement in an IPR. Potential confounding variables included gender, race/ethnicity (Hispanic versus non-Hispanic), injury severity score (ISS), anatomical site of injury, mechanism of injury (blunt versus penetrating), Charlson comorbidity index, discharge destination (for LOS), and insurance status. The study population was then stratified by race/ethnicities and discharge destinations for further analysis on LOS. Multivariate logistic regression analysis was also used to determine the relationship between documentation status and IPR placement while adjusting for potential confounders, as seen in previous literature.⁴

Insurance status was defined as either being insured (commercial insurance, health maintenance organization, Medicare/Medicaid, managed care organization, automobile insurance, and other state/federal programs) or uninsured (self-paying). To account for any possible effects of comorbid diseases on patient outcomes, the Charlson comorbidity index was calculated for each patient.²³ Discharge destinations were grouped into the following categories: home (home with or without home health assistance, jail, or psychiatric facility), IPR, long-term care (skilled nursing facility or nursing home), against medical advice, or other destination (transferred to another health care facility or other acute care hospital).²⁴

Patients excluded were those who were missing an ISS ($n = 525$; 7.0%), had a LOS greater than 30 d ($n = 137$; 1.8%), or were admitted with a significant traumatic brain injury (TBI; $n = 1466$; 19.6 %): associated with increased LOS and higher mortality rates.²⁵ Patients missing an ISS were those whose injuries were not activated into our hospitals as trauma, and as such, had an ISS of zero. Patients with a TBI were those who had a head anatomical injury score of ≥ 3 .²⁵ Considering the complex nature of TBIs and the associated increase in in-hospital LOS and mortality rates,^{25,26} these patients were removed to remove any effects of unidentified confounding variables and to investigate this specific trauma in the future. Patients with an LOS >30 d were those who were largely represented by having delays in discharge and were therefore excluded as outliers. All other exclusions included those patients whose medical records were missing sufficient information for the determination of patients' insurance status ($n = 174$; 2.3%), disposition ($n = 75$; 1.0%), and race/ethnicity ($n = 186$; 2.5%).

All statistical analyses were conducted using STATA/SE 14 statistical software (College Station, TX). Then, t-tests and chi-squared analyses were used to compare demographic and clinical data. Continuous variables were reported as the mean (μ) \pm standard deviation. Multivariate regression analysis of continuous outcome variables was performed with linear

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