

## Original Contributions

### GUNSHOT VICTIMS AT A MAJOR LEVEL I TRAUMA CENTER: A STUDY OF 343,866 EMERGENCY DEPARTMENT VISITS

David C. Moore, BA,\* Zachary T. Yoneda, BA,\* Mallory Powell, BA,† Daniel L. Howard, PHD,‡  
A. Alex Jahangir, MD,† Kristin R. Archer, PHD, DPT,† Jesse M. Ehrenfeld, MD, MPH,§  
William T. Obremskey, MD, MPH,† and Manish K. Sethi, MD†

\*Vanderbilt University School of Medicine, Nashville, Tennessee, †Department of Orthopedic Surgery and Rehabilitation, Vanderbilt University Medical Center, Nashville, Tennessee, ‡Robert Wood Johnson Foundation Center for Health Policy, Meharry Medical College, Nashville, Tennessee, and §Department of Anesthesiology, Vanderbilt University Medical Center, Nashville, Tennessee

Reprint Address: Manish K. Sethi, MD, Department of Orthopedic Surgery and Rehabilitation, Vanderbilt University Medical Center, Medical Center East, South Tower, Suite 4200, Nashville, TN 37232-8774

**Abstract—Background:** Disturbing trends regarding the sex, age, and race of gunshot victims have been reported in previous national studies; however, gunshot trends have not been well documented in individual cities in the southeastern United States. **Objectives:** 1) Analyze trends in gunshot wounds, particularly the association between gunshot wounds and race, among victims presenting to a Level I Trauma Center in Middle Tennessee; 2) Compare specific characteristics of gunshot victims to the general Emergency Department (ED) population. **Methods:** This is a retrospective cohort study of 343,866 ED visits from 2004 to 2009. **Results:** Compared to the general ED population, gunshot victims were more predominantly male (87.5% vs. 43.4%), black (57.6% vs. 29.5%), younger (47.8% under age 25 years vs. 31.6%), and demonstrated higher Medicaid enrollment (78.6% vs. 44.7%). The majority of black gunshot victims were aged 18–25 years (47.1%) and victims of assault (65.9%). Non-black gunshot victims suffered more unintentional (40.2% vs. 28.2%) and self-inflicted (9.1% vs. 0.4%) injuries and were more evenly distributed among ages 18–55 years. Black patients were 3.03 (95% confidence interval 2.93–3.14) times more likely to present to this ED for gunshot wounds than non-black patients, after controlling for age, sex, and insurance status ( $p < 0.001$ ). **Conclusions:** Our study demonstrates that black patients between 18 and 25 years of age presenting to this trauma center are more likely to be victims of gun violence than their non-

black counterparts. Our study evaluates trends in gun violence in the Southeast, particularly in relation to race, age, and insurance status. © 2013 Elsevier Inc.

**Keywords—**gun shot wounds; health policy; crime victims; trauma centers; urban health

#### INTRODUCTION

Despite decades of research, gun violence remains a significant cause of mortality, morbidity, and preventable health care spending (1–3). Previous national studies and retrospective reviews have demonstrated clear racial disparities regarding the incidence of gunshot wounds (4,5). Nationally, firearm-associated deaths in the black population have been reported at rates of 2.2 times higher than their white counterparts (6). Similarly, in 1996 Vassar and Kizer described gunshot victims in the state of California as predominantly black males aged 15–24 years (5). With regard to gunshot wounds specifically among the black population, multiple national database studies have demonstrated similar trends (7–12). In contrast, attempts to identify race or insurance status as independent predictors of mortality after a gunshot wound have produced mixed results (8,13–17).

Although previous studies over the past two decades have demonstrated disparities in gun violence specifically in the black population, these observations have been noted predominantly in the context of national database reviews. It is important to examine whether these nationally documented trends regarding gun violence are applicable to individual cities around the country so that appropriate educational, prevention, and intervention strategies can be developed. In this study, we used data from one of the nation's busiest Level I Trauma Centers to determine the demographic and injury profiles of gunshot victims presenting to the Emergency Department (ED) relative to the general Emergency Department (GED) population, and subsequently, to distinguish unique characteristics and trends of the gunshot wound (GSW) population. Because this institution maintains the only Level I Trauma Center within a 150-mile radius, it treats all life- and limb-threatening GSWs and is therefore uniquely positioned to examine the general trends of firearm-related injuries in middle Tennessee. This retrospective cohort study simultaneously examines the characteristics of patients sustaining GSWs, specifically age, race, sex, insurance status, and their mechanism of injury at a major Level I Trauma Center. By highlighting regional trends in gun violence, this study provides policymakers with sound evidence on which to develop new prevention strategies. Additionally, such data can be used to educate communities about the specific risks and trends of GSWs.

## METHODS

### *Data Acquisition*

Data were acquired by extraction of all visits to the Vanderbilt University Medical Center ED from January 1, 2004 through December 31, 2009 from the hospital billing database. This Medical Center in Nashville Davidson County is middle Tennessee's only Level I Trauma Center within a 150-mile radius. Each entry represents a separate charge for the first 30 min of an ED visit. Gunshot victims were identified as having any of the following International Classification of Diseases, 9<sup>th</sup> Revision (ICD-9) codes within the first four ICD-9 descriptors (E922.0–E922.9, E955.0–E955.4, E965.0–E965.4, and E985.0–E985.4), which also were used to determine the mechanism of injury. Gunshot victims were described only once, unless a patient suffered a separate GSW on another occasion. Subsequent visits to the ED pertaining to the same GSW were included within the GED population. Age, insurance status, sex, race, and method of injury were recorded as described in the patient record for that visit. Race was self-reported from a fixed set of categories or deter-

mined by a nurse if the patient was incapacitated. Patients described as Asian/Pacific Islander, American Indian, Hispanic, or unknown were recorded as "other" in our study. For simplicity, our bivariate and multivariate analysis was limited only to those patients whose race was recorded as black vs. all others (non-black). Insurance class descriptions were extracted from financial data and grouped into one of five categories: Medicare, Medicaid (including all government health insurance programs), commercial, uninsured, and unknown.

### *Statistical Methods*

All ED visits from the years 2004 through 2009 for patients older than 13 years of age were considered for analysis (343,866 patients). Children under the age of 14 were excluded from our analysis because this demographic has been previously described and is not prevalent in this patient population (11). For purposes of analysis, age was placed into seven categories: 14–17 years, 18–25, 26–35, 36–45, 46–55, 56–65, and more than 65 years. For 22,223 patients presenting to the ED (6.46% of total), insurance status was unknown. To account for incomplete insurance data for patients, data for this category were multiply imputed eight times using logistic regressions from all other variables available. To further characterize the GSW population, we compared their demographic information to that of the GED population at the same Trauma Center. For analysis within the GSW population, a Fisher's exact test was used for method of injury and insurance status and chi-squared and Student's *t*-tests were used for age distribution. For sensitivity, a Fisher's exact test was performed on each of the eight imputed data sets for insurance status and the original data, without change in trend. We fit a multivariable logistic regression model to the total ED population  $\geq 14$  years of age from the years 2004 to 2009, with a GSW diagnosis being the dependent variable. The multivariable model included race, insurance status, sex, and age <25 years. As gunshots may exhibit a yearly variance in incidence from year to year (clustering), overall trends in the gunshot incidence were taken into account by clustering the data by year. As a reference category, results are presented compared to a non-black male over the age of 25 years with commercial health insurance.

## RESULTS

Using our selection criteria, 343,866 individual ED encounters were identified during a 6-year period (2004 through 2009). Characteristics of the GED population are presented in Table 1. The majority (70.5%) of the GED population was non-black. Gender distribution showed a slight female predominance (51.8%) in number of visits and a highly skewed and tapering age distribution

Download English Version:

<https://daneshyari.com/en/article/3248501>

Download Persian Version:

<https://daneshyari.com/article/3248501>

[Daneshyari.com](https://daneshyari.com)