Brief Report

Violence Related Injuries among Individuals Admitted to a Level I Trauma Center in Atlanta, 2011-2013

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ABSTRACT

Background: Violence related injuries (VRIs) are a major public health problem in the United States (US). According to the Centers for Disease Control and Prevention (CDC), homicide is the 11th leading cause of death in the US and the third leading cause of death among persons aged 15-24 years old. Among African Americans aged 10-34, homicide is the leading cause of death and is the fifth leading cause of death among those 35-44 years old. One form of homicide that can result in injury resulting in death is firearm violence. The objective of this study is to assess the rates of VRIs among African American males who have been admitted to a Level I trauma center serving metropolitan Atlanta, Georgia.

Methods: A retrospective analysis of trauma patients admitted to a level 1 trauma center for VRIs over a 3 year period from 2011 to 2013. Data were obtained from the Grady Memorial Hospital (GMH) trauma registry, which serves metropolitan Atlanta, GA. De-identified variables selected included gender, race/ethnicity, age, type of VRI, and year of admission. All analyses were conducted utilizing SAS version 9.2.

Results: Of the total number of patients (n=2859) the majority were male (89%), African- American (80%) and between the ages of 20-40 years (61%). The majority of patients (55%) were admitted to the hospital for gunshot wounds followed by assault (33%) and stab wounds (12%). The numbers of VRI patients admitted were similar in each of the years 2011, 2012, and 2013, which represent 31%, 35%, and 34% of the total, respectively.

Conclusions: Statistically significant differences were observed between gender, race and age with respect to all VRIs included in the analyses, particularly among African American males. Policy makers may consider targeting interventions accordingly to address VRIs. Further research is needed to identify other factors potentially associated with VRIs.

Keywords: violence, injuries, guns, Atlanta, African American, males

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INTRODUCTION

Homicide is the "unlawful taking of a person's life, with the expressed intention of killing or rendering bodily injury resulting in death, and not in the course of some other criminal activity" (Luckenball, 1977). Homicide is the 11th leading cause of death in the US and the second leading cause of death for young persons who are ages 15-24 years old (Centers for Disease Control and Prevention [CDC], 2011). Among African Americans aged 10-34, homicide is the leading cause of death, and is the fifth leading cause of death among those 35-44 years old. (CDC, 2014). Among 10-24 year-old Hispanics, homicide is the second leading cause of death; and it is the third leading cause of death in American Indians and Alaska Natives in this age cohort (CDC, 2012). One form of homicide is firearm violence.

According to the National Institute of Justice (NIJ), individuals between the ages of 15 and 24 years are more likely to be targeted by firearm violence as opposed to other forms of violence (National Institute of Justice [NIJ], 2013). The majority of violent gun crime, particularly homicide, occurs in cities and urban communities (NIJ, 2013).

The objective of this study was to examine the rates of Violence Related Injuries (VRIs) among individuals who were admitted to a level I trauma center serving metropolitan Atlanta, Georgia from 2011-2013.

METHOD

A retrospective analysis of trauma patients admitted to a level 1 trauma center for VRIs over a 3-year period from 2011 to 2013. Data were obtained and collected electronically through the Grady Memorial Hospital (GMH) trauma registry, which serves metropolitan Atlanta, GA. GMH is a regional trauma resource center that is a tertiary care facility, central to the trauma care system. According to the American College of Surgeons (ACS), the Level I facility is a regional resource trauma center that is a tertiary care facility central to the trauma care system and the facility must have the capability of providing leadership and total care for every aspect of injury, from prevention through rehabilitation (American College of Surgeons [ACS], 2014). Data were de-identified to ensure confidentiality. Variables included in the analysis: gender, race/ethnicity, age, type of VRI, and year of admission. This study was approved by the Morehouse School of Medicine Institutional Review Board and Grady Research Oversight Committee.

Statistical Analyses

Univariate analyses were conducted to describe the characteristics of the patients. All analyses were conducted using SAS version 9.2, Cary, NC.

RESULTS

The demographic and other characteristics of the patients are summarized in Table 1. Of the total number of patients admitted to the trauma center (2,859), the majority were male (89%), African American (80%), and 20-39 years old (61%) (Table 1). The breakdown of VRI patients by the type of VRI shows that the majority (55%) were admitted to the center because of gunshot wounds followed by assaults (33%). Similar patterns of VRIs were observed for the year 2011, 2012, and 2013.

Table 1. Number and percentage distribution of patients by select characteristics

Select Characteristics	N	%
Gender		
Female	316	11
Male	2543	89
Race		
African American	2285	80
White	376	13
Asian	27	1
Hispanic	13	0.5
American Indian	2	0.1
Unknown	12	0.4
Other	144	5
Age		
Less than 10	5	0.1
10-19	202	7
20-29	1049	37
30-39	692	24
40-49	425	15
50-59	363	13
60-69	93	3
70 and over	26	1

Select Characteristics	N	%
Type of VRI's		
Gunshot	1585	55
Assault	930	33
Stab wound	344	12
Year		
2011	874	31
2012	1011	35
2013	974	34

Table 2 also indicates that a statistically significant difference was observed between genders with respect to the type of VRIs. As shown in Table 2, of the total number of patients admitted to the center, males were significantly more likely than females to be admitted because of gunshots (50% vs 5%), assaults (28% vs. 5%), and stab wounds (11% vs. 1%).

Moreover, table 2 indicates that a statistically significant difference was observed between race and age group with respect to gunshots, assaults, and stab wounds. The majority of gunshot, assault, and stab wounds occurred among African Americans, 47%, 24%, and 9%, respectively (Table 2). Additionally, Table 2 shows that the majority of the patients admitted to this level I trauma center were within the age group of 20-29 and 30-39, which were 24% and 14%, respectively (Table 2).

Table 2. Number and percentage distribution of the Type of VRIs by selected characteristics

Select Characteristics	Type of Violence				
	Gun shot n (%)	Assault n (%)	Stab wound n (%)	Total n (%)	p-value
Gender					**.0004**
Female	143 (5)	131 (5)	42 (1)	316 (11)	
Male	1442 (50)	799 (28)	302 (11)	2543 (89)	
Race					**<.0001**
African American	1332 (47)	688 (24)	265 (9)	2285 (80)	
White	161 (6)	161 (6)	54 (2)	376 (13.08)	
Asian	15 (0.5)	12 (0.4)	0 (0)	27 (0.94)	
Hispanic	5 (0.2)	3 (0.1)	5 (0.2)	13 (0.45)	
American Indian	0 (0)	2 (0.1)	0 (0)	2 (0.07)	
Unknown	9 (0.3)	2 (0.1)	1 (0.03)	12 (0.42)	
Other	63 (2)	62 (2)	19 (0.7)	144 (5.04)	
Age					**<.0001**
Less than 10	5 (0.2)	0 (0)	0 (0)	5 (0.18)	
10-19	142 (5)	48 (2)	12 (0.4)	202 (7.10)	
20-29	691 (24)	248 (9)	110 (0.4)	1049 (36.70)	
30-39	410 (14)	192 (7)	90 (3)	692 (24.20)	
40-49	177 (6)	182 (6)	56 (2)	415 (14.52)	
50-59	107 (4)	197 (7)	59 (2)	363 (12.70)	
60-69	30 (1)	52 (2)	11 (0.4)		
70 and over	13 (0.5)	9 (0.3)	4 (0.1)	26 (0.91)	
Year of Violence					0.332
2011	471 (16)	283 (10)	120 (4)	874 (30.57)	
2012	576 (20)	319 (11)	116 (4)	1011 (35.36)	

Select Characteristics	Type of Violence				
	Gun shot n (%)	Assault n (%)	Stab wound n (%)	Total n (%)	p-value
2013	538 (19)	328 (12)	108 (4)	974 (34.10)	

No statistically significant differences were observed between years of gunshot, assault, and stab wounds (p=0.332). Specifically, similar patterns of admission to this level I trauma center related to gunshots, assaults, and stab wound related injuries were observed during the year 2011, 2012, and 2013 (Table 2).

DISCUSSION

The breakdown of the patients by the type of VRI shows that the majority (55%) were admitted to this trauma center due to gunshot wounds. From the perspective of violence, males were disproportionately representative in all VRIs in all mechanisms of violence. Similar to our findings, a study by Smith and Cooper showed that males suffered more from firearm violence than females (Smith & Cooper, 2013). Furthermore, from 2002 to 2011, the average homicide rate for males was nearly four times greater than the rate for females (Smith & Cooper, 2013).

Our findings indicate that, compared to whites, African Americans were eight times more likely to be admitted for gunshot wounds, four times more likely to be admitted for assault, and five times more likely to be admitted for stab wounds (Table 2). Our findings are consistent with previous studies, which indicate that African Americans are disproportionately affected by firearm violence compared to any other race and that African American males ages 18-24 years have the highest rate of firearm homicide. (Planty & Truman, 2013).

In terms of age, we found that patients who were between the ages of 20-29 had an increased risk of being affected by violence. Similar to our findings, in 2010, the rate of firearm homicide for African Americans was 14.6 per 100,000, compared to 1.9 for whites. (Planty & Truman, 2013).

The limitation of this study is that our analyses examined only a three year time period (2011-2013). The findings in the study might have been more generalizable if the study exceeded 2011-2013.

CONCLUSIONS

The incidence of VRIs is higher among African Americans, males, and those between the ages of 20-39 years. Our findings provide quantifiable information for policy makers to address VRI's in metropolitan Atlanta, Georgia. Health care practitioners, community stakeholders, city, county, and state officials should consider tailored programs in high-risk populations to reduce VRIs.

Further research is needed to identify other factors that may increase the likelihood of VRIs in metropolitan Atlanta. Additional variables such as insurance status, county zip codes, and employment status may be considered for future studies to examine VRIs.

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References

American College of Surgeons (ACS) Committee on Trauma. (2014, December 1). Retrieved December 7, 2016, from https://www.facs.org/~/media/files/quality%20programs/trauma/vrc%20resources/resources%20for%20optimal%20care.ashx

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS), 1999-2013. 10 Leading causes of injury deaths by race group, United States. Retrieved from http://webappa.cdc.gov/cgi-bin/broker.exe.

Centers for Disease Control and Prevention. National Center for Health Statistics (NCHS), National Vital Statistics System. 10 Leading Causes of Injury Deaths by Age Group Highlighting Violence-Related Injury Deaths, United States – (2011). Retrieved from: http://www.cdc.gov/injury/wisqars/pdf/leading_causes_of_injury_death_highlighting_violence_2011-a.pdf.

Centers for Disease Control and Prevention. National Center for Health Statistics (NCHS), National Vital Statistics System. 10 Leading Causes of Death by Age Group, United States – (2011). Retrieved from:

http://www.cdc.gov/injury/wisqars/pdf/leading_causes_of_death_by_age_group_2011-a.pdf.
Luckenbill, D. (1977). Criminal homicide as a situated transaction. Social problems. Vol.25, No.2; pp.176-186. http://www.jstor.org/discover/10.2307/800293?uid=20480192&uid=3739616&uid=2&uid=3&uid=20480168&uid=67&uid=62&uid=3739256&sid=21104047602411\
National Institute of Justice. Who is most affected by gun violence? http://www.nij.gov/topics/crime/gun-violence/Pages/affected.aspx#note1.
Planty, T., Truman, L. (2013). Firearm Violence, 1993-2011. Bureau of Justice Statistics. Office of Justice Programs. Retrieved from: http://www.bjs.gov/content/pub/pdf/fv9311.pdf.
Smith, E., Cooper, A. (2013). Homicide in the U.S. known to law enforcement, 2011. Bureau of Justice Statistics. Office of Justice Programs. Retrieved from: http://www.bjs.gov/content/pub/pdf/hus11.pdf.