

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

Weaker gun state laws are associated with higher rates of suicide secondary to firearms



Rodrigo F. Alban, MD,^{a,*} Miriam Nuño, PhD,^b Ara Ko, MD,^a
Galinos Barmparas, MD,^a Azaria V. Lewis, BS,^a
and Daniel R. Margulies, MD^a

^aDivision of Acute Care Surgery, Department of Surgery, Trauma and Critical Care, Cedars-Sinai Medical Center, Los Angeles, California

^bCenter for Neurosurgical Outcomes Research, Maxine Dunitz Neurosurgical Institute, Cedars-Sinai Medical Center, Los Angeles, California

ARTICLE INFO

Article history:

Received 10 January 2017

Received in revised form
20 June 2017

Accepted 14 August 2017

Available online xxx

Keywords:

Suicide
Firearms
Gun laws
Mortality
Brady state scorecard

ABSTRACT

Background: Firearm-related suicides comprise over two-thirds of gun-related violence in the United States, and gun laws and policies remain under scrutiny, with many advocating for revision of the regulatory map for lawful gun ownership, aiming at restricting access and distribution of these weapons. However, the quantitative relationship between how strict gun laws are and the incidence of firearm violence with their associated mortality is largely unknown. We therefore, sought to explore the impact of firearm law patterns among states on the incidence and outcomes of firearm-related suicide attempts, utilizing established objective criteria.

Methods: The National Inpatient Sample for the years 1998–2011 was queried for all firearm-related suicides. Discharge facilities were stratified into five categories (A, B, C, D, and F, with A representing states with the most strict and F representing states with the least strict laws) based on the Brady Campaign to prevent Gun Violence that assigns scorecards for every state. The primary outcomes were suicide attempts and in-hospital mortality per 100,000 populations by Brady state grade.

Results: During the 14-year study period, 34,994 subjects met inclusion criteria. The mean age was 42.0 years and 80.1% were male. A handgun was utilized by 51.8% of patients. The overall mortality was 33.3%. Overall, 22.0% had reported psychoses and 19.3% reported depression. After adjusting for confounding factors and using group A as reference, there were higher adjusted odds for suicide attempts for patients admitted in group C, D, and F category states (1.73, 2.09, and 1.65, respectively, all $P < 0.001$).

Conclusions: Firearm-related suicide attempt injuries are more common in states with less strict gun laws, and these injuries tend to be associated with a higher mortality. Efforts aimed at nationwide standardization of firearm state laws are warranted, particularly for young adults and suicide-prone populations.

Level of evidence: III.

Study type: Trauma Outcomes study.

© 2017 Elsevier Inc. All rights reserved.

* Corresponding author. Cedars-Sinai Medical Center, Department of Surgery, 8700 Beverly Blvd, Suite 8215N, Los Angeles, CA 90048. Tel.: +(310) 423 5874; fax: +(310) 423 0139.

E-mail address: Rodrigo.Alban@cshs.org (R.F. Alban).
0022-4804/\$ – see front matter © 2017 Elsevier Inc. All rights reserved.
<http://dx.doi.org/10.1016/j.jss.2017.08.027>

Introduction

In 2013, over 33,000 deaths in the United States were associated with the discharge of firearms.¹ Although homicide by firearms has been a serious issue at the forefront of media, 63% of deaths by firearms are, in fact, self-inflicted. According to the Centers for Disease Control and Prevention, there are approximately 830,000 emergency room visits every year, secondary to self-inflicted injuries with nearly 43,000 yearly deaths. Of those, nearly 50% of them are caused by firearms, representing a fatality rate of 6.7 per 100,000 population. This significant issue has proven to be a significant public health threat requiring strategies for prevention.²

The availability of firearms is associated with higher rates of suicide,³⁻⁸ with mounting evidence suggesting that restricting access to firearms may be an effective strategy for suicide prevention.^{9,10} Countries such as Denmark,¹¹ Israel,¹² and Australia¹³ have witnessed significant falls in suicide rates that have paralleled gun law reforms. With significant controversy, several US states have mandated different laws to restrict gun ownership, but these are not uniform across the nation. Owing to widely differing state laws, a method to compare the strength of state gun laws was formulated by the Brady Campaign to Prevent Gun Violence and the Law Center to Prevent Gun Violence.¹⁴ Each of the 50 states was assigned a scorecard based on 30 policy approaches and were graded from A to F, with the weakest gun laws graded as an F.

Existing studies examining gun control and suicide in the United States have been limited by design, as they may be time series analyses, use cross-sectional data, or are based on simple correlations without taking into account other risk factors for suicide.^{15,16} The most recent study analyzed state-level data from 1995-2004 and demonstrated that gun laws that decrease the overall availability of guns have a greater effect on decreasing the prevalence of suicide than those that restrict ownership in high-risk individuals.¹⁰ Since then, however, there have been limited data and lack of comprehensive research on this topic.

To determine a more objective method to understand suicide estimates and outcomes on national inpatient data, we sought to examine the relationship in firearm-related hospital admissions for suicides or suicide attempts among states based on their firearm law patterns. Because of the variation of state laws, the Brady Campaign state scorecard was used to compare the overall strength of state gun laws. We hypothesized that states with weaker gun laws will exhibit higher rates of suicide by firearms, even after controlling for risk factors of self-harm.

Methods

Data source and patient selection

Data from 1998-2013 were obtained from the Healthcare Cost and Utilization Project of the Agency for Healthcare Research and Quality.¹⁷ The National Inpatient Sample (NIS) is the largest all-payer inpatient database produced by the Agency for Healthcare Research and Quality. It includes a stratified

20% random sample of all nonfederal inpatient hospital admissions throughout the United States, capturing more than 7 million discharges annually, and it uses a weighting scheme to estimate approximately 95% of all US inpatient care. Data corresponding to years 2012 and 2013 are excluded in this study, given that hospital-specific identifiers (i.e. location by state) are no longer available in NIS starting on 2012. Patients admitted to the hospital with a diagnosis of firearm-related suicide injury were queried according to the International Classification of Diseases-Ninth Revision-Clinical Modification and E codes such as E955.0, E955.1, E955.2, E955.3, and E955.4 (Supplementary Table 1). Patients with missing state-level information or age were excluded from our analysis.

State firearm legislation and groups

To evaluate the role of gun laws at the state level and the risk of firearm-related suicides, we categorized hospitals into five groups (A, B, C, D, and F) according to the Brady Campaign to Prevent Gun Violence and the Brady Center to Prevent Gun Violence criteria (referred to collectively herein as the Brady Center).¹⁴ The Brady Center has tracked firearm legislation annually since 2007 and prepares legislative scorecards for every state each year. Hospital categories according to Brady grades A-F are as follows: A - CA, CT, MD, NJ, and NY; B - HI, IL, MA, and RI; C - CO, IA, MI, MN, PA, WA, and WI; D - IN, NE, OH, OR, and VA; and F - AK, AR, AZ, FL, GA, KS, KY, LA, ME, MO, MS, MT, NC, ND, NH, NM, NV, OK, SC, SD, TN, TX, UT, VT, WV, and WY.

Data variables

A patient's age in years, along with gender, race, insurance (medicare, medicaid, private, self-pay, and other), and median household income were reported. Hospital-level characteristics such as bed size (e.g. small, medium, and large), teaching versus nonteaching, region (northeast, midwest, south, and west), and location (urban and rural) were described. Secondary conditions such as alcohol abuse, drug abuse, psychoses, and depression were also documented. Type of weapon used in the reported cases of suicide was also described (handgun, shotgun, hunting rifle, military arm, and other unspecified).

Outcome variables

Suicides, including attempts and in-hospital mortality per 100,000 populations by year and Brady state grade were the main outcomes of interest in this study. Secondly, we explored the relationship between Brady state grade and the risk of firearm-related suicide while adjusting for confounders such as age, gender, race, income, alcohol abuse, drug abuse, psychoses, and depression.

Statistical analysis

A detailed description of the data was provided in terms of means, standard errors, medians, and interquartile ranges. Adjusted odds ratio (OR) of suicides and 95% confidence

Download English Version:

<https://daneshyari.com/en/article/5733662>

Download Persian Version:

<https://daneshyari.com/article/5733662>

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