Spectrum of injuries resulting from gunshot wounds in car hijacking: a South African experience

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ABSTRACT

Background Car hijacking, known as “carjacking”, is a form of aggravated robbery of a vehicle from the driver frequently involving firearm and is common in South Africa. There is, however, little literature on the spectrum of injuries sustained by victims of car hijacking. The study aimed to describe the spectrum of gunshot wound-related (GSW) injuries and review our experience of management of victims of car hijacking in our trauma center based in South Africa.

Methods A retrospective review was conducted during an 8-year period from January 2010 to January 2018 on all patients who presented with any form of GSW after a car hijacking incident.

Results During the 8-year study period, a total of 101 patients were identified. Seventy-four percent were male (75 of 101) and the mean age was 34 years. The mean time from injury to arrival at our trauma center was 7 hours (4 hours; p<0.001). Seventy-five percent (76 of 101) of all patients sustained GSWs to multiple body regions, whereas the remaining 25% (25 of 101) were confined to a single body region. The most common region involved was the chest (48 cases), followed by the abdomen (46 cases) and neck (34 cases). Sixty-three of the 101 (62%) patients required one or more operative interventions. The most common procedure was laparotomy (28 cases), followed by vascular (20 cases) and neck (14) exploration. Eighteen percent (18 of 101) of all patients required intensive care unit admission. The overall mortality was 13% (16 of 101) and the overall mortality was 18% (18 of 101).

Discussion The spectrum of injuries from GSW related to car hijacking commonly involves close range GSWs to multiple body regions. Torso trauma is common and a substantial proportion of victims require major operative interventions. The mortality from these injuries is significant.

Level of Evidence Level III.

INTRODUCTION

Car hijacking, commonly referred to as “carjacking”, is an aggravated robbery of a vehicle from the driver which usually involves the use of a firearm.1 South Africa has one of the highest rates of car hijacking in the world, with an average of 46 vehicles being hijacked per day, which equates to 2 every hour.2 Between 2016 and 2017 alone, 16 717 hijacking incidents were recorded by the South African Police Service (SAPS). This alarming figure was the highest recorded in the past decade and represents a 15% increase from the previous year.2 There is, however, little literature on the spectrum of injuries sustained by victims of car hijacking. In light of this, we set out to describe the spectrum of gunshot wound-related (GSW) injuries sustained and review our experience of management of victims of car hijacking in the setting of a low-income/middle-income country.

PATIENTS AND METHODS

Clinical setting

This was a retrospective, observational study that focused specifically on patients who sustained GSWs during a car hijacking incident. The study was based at the Pietermaritzburg Metropolitan Trauma Service (PMTS), Pietermaritzburg, South Africa. The PMTS provides definitive trauma service to the city of Pietermaritzburg, the capital of KwaZulu Natal (KZN) province. KZN is located on the east coast of the country and has a population of over 11 million. Fifty percent of the population live in rural areas.1 The PMTS is the largest academic trauma center in western KZN and is the tertiary trauma referral center covering a total catchment population of over three million people. Due to the high incidence of interpersonal violence and criminal activities in our region, penetrating trauma is exceedingly common and represents a significant proportion of workload at our institution. The PMTS maintains a formal electronic regional trauma registry. All patients who present to our trauma center are prospectively entered into the electronic database, and the pertinent information entered include details regarding injury mechanism, operative intervention, patient progress, and clinical outcomes. Our catchment area is divided into two distinct health districts. The urban district (UD) includes the city of Pietermaritzburg and the surrounding suburban areas. The rural district (RD) includes all areas outside the geographic boundaries of the city of Pietermaritzburg.

The study

A retrospective review was conducted during an 8-year period from January 2010 to January 2018 on all patients who presented with any form of GSW after a car hijacking incident. Basic demographic details including age and gender were reviewed. Specific information was sought from the prehospital emergency medical service (EMS) documentation in relation to the location of incidence, transport time, and time of arrival at our trauma center. Further clinical information reviewed included body regions injured, operative interventions, need for intensive care unit (ICU) admission, morbidity, and mortality.

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Despite the usual media coverage, The Detroit News coined the term “car hijacking” and was first coined by EJ Mitchell. Carjacking remains an under-researched and poorly understood crime. Even then, those who use the service are likely to be a specific subgroup of the population who are able to afford it, and thus these data would not provide the entire picture. With technological advances in recent years, several mobile phone applications and roadside assistance specifically related to carjacking are now available which provide cumulative collected user statistics. These data would not provide the entire picture. With technological advances in recent years, several mobile phone applications and roadside assistance specifically related to carjacking are now available which provide cumulative collected user statistics. These data would not provide the entire picture. With technological advances in recent years, several mobile phone applications and roadside assistance specifically related to carjacking are now available which provide cumulative collected user statistics. These data would not provide the entire picture.

Results

Demographics

During the 8-year study period, a total of 101 patients with GSW related to car hijacking incidents were identified. During the same period, 1645 GSW victims were treated at our institution; thus, the proportion of GSW related to car hijacking constituted 6% of all GSWs managed. Seventy-four percent were male (76 of 101) and the mean age was 34 years. Fifty-five percent (56 of 101) of these occurred in the RD outside the catchment of the city of Pietermaritzburg, and the remaining 45% (45 of 101) occurred within the UD. The median time from injury to arrival at our trauma center for those in the RD was 9 hours (Q1, Q3: 9, 9), and the median time for those in the UD was 3 hours (Q1, Q3: 3, 3) (p<0.001).

Injury pattern

Seventy-five percent (76 of 101) of all patients sustained GSWs to multiple body regions, whereas the remaining 25% (25 of 101) were confined to a single body region. Table 1 summarizes the frequency injury encountered by body region.

Operative interventions

Sixty-three of the 101 (62%) patients required one or more operative interventions. Table 2 summarizes the operative procedures performed and the associated injuries.

Clinical outcome

Eighteen percent (18 of 101) of all patients required ICU admission. The median length of hospital stay was 7 days (Q1, Q3: 6, 8). The overall morbidity was 13% (16 of 101) and the overall mortality was 18% (18 of 101). The 18 deaths were related to the following: 6 died from hospital-acquired pneumonia, 4 exsanguinated in the operating room from intra-abdominal vascular injury prior to vascular control were possible, 3 with major cardiac and/or pulmonary hilar injury and 1 had combined thoracic great vessel and intra-abdominal vascular injury, 3 died from Multiple Organ Failure (MOF) (expired 48 hours after the initial operation). 1 died from acute respiratory distress syndrome (ARDS).

Discussion

Carjacking is common in South Africa and the incidence remains the highest in the world. The word “carjacking” is a portmanteau of “car” and “hijacking” and was first coined by EJ Mitchell, an editor in The Detroit News. Despite the usual media coverage, carjacking remains an under-researched and poorly understood problem. Data were processed and analyzed using Stata V143.0. χ² tests were used to examine differences in categorical transport time between urban and rural cases.

Statistical analysis

Data were processed and analyzed using Stata V143.0. χ² tests were used to examine differences in categorical transport time between urban and rural cases.

Table 1 Injury by body region

| Body region | Frequency |
|-------------|-----------|
| Chest       | 48        |
| Abdomen     | 46        |
| Neck        | 34        |
| Lower limb  | 33        |
| Upper limb  | 28        |
| Head        | 12        |
| Pelvis      | 9         |

Table 2 Operative interventions in 63 patients

| Operations                  | n  |
|-----------------------------|----|
| Neurosurgery                | 2  |
| Neck exploration            | 14 |
| Venous                      | 9  |
| Arterial                    | 5  |
| Esophageal                  | 6  |
| Tracheal                    | 3  |
| Laryngeal                   | 3  |
| Cervical spine              | 6  |
| Thoracotomy                 | 5  |
| Cardiac and great vessels   | 2  |
| Pulmonary                   | 4  |
| Laparotomy                  | 28 |
| Small bowel                 | 8  |
| Colon                       | 2  |
| Rectum                      | 2  |
| Stomach                     | 3  |
| Duodenum                    | 3  |
| Pancreas                    | 2  |
| Liver                       | 6  |
| Spleen                      | 3  |
| Kidney                      | 6  |
| Bladder                     | 10 |
| Ureter                      | 2  |
| Intra-abdominal vascular    | 3  |
| Urethral                    | 2  |
| Vascular exploration        | 20 |
| Brachial artery             | 4  |
| Radial artery               | 1  |
| External iliac artery       | 14 |

Table of contents

1. Introduction
2. Materials and Methods
   a. Participants
   b. Data Collection
3. Results
   a. Demographics
   b. Injury pattern
4. Operative interventions
5. Clinical outcome
6. Discussion
7. Statistical analysis
8. Conclusion
9. References
Box 1  Make of the 10 most frequently hijacked vehicle in South Africa.12

- Volkswagen.
- Toyota.
- Ford.
- Citroen.
- Kia.
- Hyundai.
- BMW.
- Audi.
- Renault.
- Chevrolet.

CONCLUSIONS

The spectrum of injuries from GSW related to car hijacking commonly involves close range GSWs in multiple body regions. Torso trauma is common and a substantial proportion of victims require major operative interventions. The mortality from these injuries is significant.

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