Journal of Forensic and Legal Medicine 39 (2016) 42–45

Contents lists available at ScienceDirect

Journal of Forensic and Legal Medicine

journal homepage: www.elsevier.com/locate/jflm

Original communication

Interpersonal violence in road rage. Cases from the Medico-Legal Center for Victims of Violence in Hamburg

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ARTICLE INFO

Article history:
Received 23 July 2015
Received in revised form
20 October 2015
Accepted 29 November 2015
Available online 18 December 2015

Keywords:
Road rage
Victimology
Clinical forensic medicine
Road traffic
Interpersonal violence

ABSTRACT

Aggressive behavior in traffic is a widespread phenomenon. Up to 90% of the population are involved in mild forms such as shouting or gesturing. More dramatic cases with injury to individuals affect at least 1100 people in the US annually. Certain factors such as a male sex, a young age and an urban residency have been identified to contribute to the likelihood of road rage. Central to this analysis is the determination of specific features regarding the conflicting parties, the crime scene and the injury pattern in violent offenses related to traffic.

In a retrospective study spanning 10 years, cases of road rage-linked injuries were identified amongst patients at the Medico-Legal Center of the Institute of Legal Medicine in Hamburg, Germany. The data were digitized and then analyzed using descriptive statistics via SPSS.

There are disproportionately large numbers of males (85.7%) and motorists (61.2%) amongst road rage perpetrators. Usually the conflicting parties have no prior relationship (89.7%). In 68.1% of the cases, the violence applied was exclusively physical. Objects were utilized in 31.0% of all cases, and in more than half (55.6%) of these cases the vehicle was used as a weapon. The resulting trauma in road rage is mostly blunt and applied to the face and the extremities.

There are characteristic features regarding the demographics, time and place of incident, as well as severity and pattern of injury in road rage associated offenses. Identifying these factors may lead to appropriate measures in the reduction of road rage.

1. Introduction

Aggressive behavior in traffic is a widespread phenomenon. In a Canadian study almost 50% of respondents were shouted at, cursed at or had rude gestures directed at them in the past year, while 7.2% were threatened with damage to their vehicle or personal injury.[1] In a similar study from the USA, up to 90% of the population reports road rage victimization.[2] More dramatic cases with injury to individuals affect at least 1100 people in the USA annually.[3] Certain factors such as the male sex,[1,3,4] young age[1,3,4] and urban residency[4] have been identified as contributing to the likelihood of road rage.

In Germany, there are additional sanctions besides criminal law available for violent offenses related to traffic. These measures consist of the suspension of the driver's license, a ban on driving and the ordinance of a medical-psychological assessment.[5] Said measures can be taken if the driving ability of the offender is impaired even if the offense itself is not a traffic violation. This is especially true when there is evidence for highly aggressive behavior.[6] However, due to a lack of awareness these specific measures are rarely executed.[7]

Establishing demographics is desirable for targeting preventive actions more effectively. This analysis therefore aims to determine specific features regarding the conflicting parties in road rage, the crime scene and the injury pattern. Central to this analysis is the damage caused in such scenarios to evaluate the presence of highly aggressive behavior.

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http://dx.doi.org/10.1016/j.jflm.2015.11.023
1752-928X/

2. Methods

2.1. Selection criteria

For the timeframe of January 1st, 2002 to December 31st, 2012, all forensic medical experts on duty completed a standardized questionnaire for every consenting victim presenting at the Center, in addition to all other forensic documentation. In this study we evaluated cases with alleged intentionally caused violence in a traffic dispute. Excluded from the study were other types of injuries in road traffic such as accidents.

2.2. Study design

The collected data were digitized using FileMaker Pro Advanced 12.0. The statistical analysis was done with Microsoft Excel 14.0 and SPSS Statistics 20.0. Group differences for nominal and ordinal data were examined using the χ^2-test (significance level $p < 0.05$). If the expected frequency in more than 20% of cells was less than five, Fisher's exact test was used. Linear correlation between two variables was done using Pearson's correlation coefficient.

3. Results

In the years 2002 through 2012, a total of 11,429 victims of violent crimes were examined at the Medico-Legal Center for Victims of Violence. Of these, $n = 116$ people were injured as a result of a conflict in traffic. That is about one case per month and equal to 1.01% of all victims examined in the given time span.

3.1. Demographics

A significantly higher number of the people involved were male. There were 88 male (75.9%, $p < 0.001$) and 28 female (24.1%) victims. In 112 cases the gender of the perpetrator was identified: 96 were male (85.7%, $p < 0.001$) and eleven were female (9.8%). Most attackers were lone perpetrators (75.9%). However, there were 20 cases of multiple male perpetrators, one case with two female perpetrators, and in five cases there were multiple perpetrators of both genders.

The age of victims ranged from twelve to 76 years, with an average age of 38.7 years ($SD = 14.05$), with no significant gender difference.

In 89.7% of cases the victim and perpetrator had no prior relationship. In 3.4% of the cases the relationship was described as brief. There was a disproportionately large number of motorists amongst the victims as well as amongst the perpetrators as opposed to bicyclists or pedestrians: 54 victims and 71 perpetrators were motorized. Of 54 motorized victims and 71 perpetrators, three victims and four perpetrators were motorcyclists.

3.2. Time and place of conflict

For the occurrence, the day was divided to 3-h segments. Most cases happened in the afternoon and night: 28 cases (24.1%) from 3 pm to 6 pm and 25 cases (21.6%) from 6 pm to 9 pm. The annual number of cases increased from six in the year 2003 to 21 in the year 2012. There were no significant differences amongst months of the year and days of the week.

Except for four cases, all conflicts took place in road traffic: 90 people were injured on the street, nine people in their own vehicle and eight people in vehicles of public transport. In public transportation, including taxis, eight passengers were victims and nine passengers were perpetrators. In four of these cases passengers attacked each other, in one case a bus driver was attacked by a passenger, in one case a security guard was attacked, and in three cases a taxi driver was attacked. Five cases took place in road traffic associated[8] commercial surroundings such as gas stations or commercial parking decks. In two cases, the location of the assault moved to other public places and in two cases the location of the assault moved from the road to the domestic environment of the victim or the perpetrator.

3.3. Conflict trigger

The cause of conflict was not part of the standardized questionnaire. Thus the conflict trigger was captured from the forensic medical report and categorized retrospectively. The most common trigger was a conflict over traffic route utilization, e.g. a cyclist riding on the street instead of the bicycle lane or a parked car blocking the sidewalk (see Table 1).

3.4. Type of violence and injury patterns

For the type of violence and type and localization of injuries, multiple answers were possible. In 79 cases (68.1%) the perpetrator used only physical violence. In 36 cases (31.0%) instruments were used, 17 of which were combined with physical violence. In 20 cases the vehicle was used as a weapon. The type of injury was mostly blunt and unformed and involving the head and extremities (see Table 2).

There were nine potentially life-threatening injuries (7.8%) and 100 non life-threatening injuries (86.2%). In seven cases (6.0%) no traces of injury were found. Fatal cases are not subject to the Medico-Legal Center for Victims of Violence and therefore were excluded from the study. Injuries to the head accounted for eight out of the nine cases of potentially life-threatening injuries. In one case severe damage to the throat and neck was assessed as potentially life-threatening.

3.5. Further medical treatment

In 55 cases (72.4%) outpatient treatment was sufficient. In twelve cases (15.8%) admission to the hospital was needed. In eight cases (10.5%) no further medical treatment was recommended, and in 40 cases further medical treatment could not be recorded retrospectively.

Out of the twelve cases that led to hospitalization, there were four cases of (suspected) cerebral concussion; one case with fractures of the maxillary sinus, the orbital wall and orbital floor (Le

Table 1
Conflict trigger.

Conflict trigger	Number of cases
Traffic route utilization	13
Conflict with the police	10[a]
Following accident/vehicle damage	8
Slowing down/blocking traffic	8
Conflict in public transport	7
Thwarting/cutting	7
Conflict over parking spot	5
Conflict over right of way	5
Following near miss	4
Crossing red light	2
Passing maneuvers	2
Speeding	2
Tailgating	1
Others	18
No apparent reason	14
No details given	10

[a] 4 victims and 6 perpetrators were police officers.