Injury, Int. J. Care Injured xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Injury

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

Pedestrian traffic injury in Victoria, Australia

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ARTICLE INFO

Article history:
Received 24 June 2017
Received in revised form 3 December 2017
Accepted 14 December 2017

Keywords:
Injury prevention
Road traffic injury
Incidence
Pedestrian

ABSTRACT

Introduction: Road traffic injuries are the fifth leading cause of years of life lost, with pedestrians comprising 39% of all road deaths (Global Burden of Disease Mortality and Causes of Death Collaborators [1]). Programs that use injury surveillance data to identify high-risk targets for intervention are known to be effective for reducing injury. This study aims to identify trends in the population incidence of pedestrian traffic injury (PTI) in Victoria, Australia.

Method: A retrospective review of data from the Victorian Emergency Minimum Dataset, the Victorian Admitted Episodes Dataset, the Victorian State Trauma Registry and the National Coronial Information System was conducted of patients with a PTI who present to a public hospital emergency department, were admitted to hospital, sustained major trauma or who died of their injuries from January 1st 2009 to December 31st 2013. The primary outcome measure was population incidence of pedestrian traffic-related emergency presentations, hospital admissions, major trauma and deaths.

Results: Over the study period, 1838 cases presented to a public hospital emergency department and were discharged without admission to hospital and an additional 3241 cases were admitted to hospital. Of these, 628 cases were classified as major trauma including 90 in-hospital deaths. From January 1st 2008 to December 31st 2011, a total of 216 deaths occurred. A decrease in the population incidence of emergency presentations for PTI was observed over the study period. No significant change was observed in the population incidence of hospital admissions, major trauma cases or deaths from PTI. The demographics of PTI were observed more commonly to be young, intoxicated males and pedestrians aged over 65 years.

Conclusions: Although the population-adjusted incidence of emergency presentations for PTI in Victoria has decreased from 2009 to 2013, no change was observed in the incidence of hospital admissions, major trauma or pedestrian fatalities. Novel programs designed to address high-risk groups should be considered to achieve further reductions in PTI and severity of injuries.

1 Introduction

Road traffic injuries are the fifth leading cause of years of life lost, with pedestrians comprising 39% of all road deaths [1]. Global attention to injury prevention and management has been associated with a reduction in pedestrian deaths in many high-income countries [2]. In Australia, pedestrian fatalities have decreased by 62% from 1995 to 2014 [3]. Nationally representative data on non-fatal pedestrian injury however is incomplete.

Statewide injury surveillance datasets can be used to inform and evaluate road safety interventions due to the accessibility of statewide injury surveillance datasets [4]. A small, but significant increase in the population incidence of hospital admissions for pedestrian traffic injury (PTI) was observed in Victoria from 2004 to 2008 [5]. Further research is indicated to identify whether this trend has continued and to identify groups with a high incidence of PTI to inform road safety initiatives.

The aims of this project were to identify trends in the population incidence of PTI in adults in Victoria, Australia from 2009 to 2013. Secondary aims were to identify patients groups commonly represented among the PTI population to target for public health initiatives.

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https://doi.org/10.1016/j.injury.2017.12.014
0020-1383/

2 Methods

2.1 Study design

A retrospective review was conducted over a five-year period from January 1st 2009 to December 31st 2013 of all adult cases of pedestrian traffic injury in Victoria, Australia. Cases were identified using the Victorian Emergency Minimum Dataset (VEMD), the Victorian Admitted Episodes Dataset (VAED), the Victorian State Trauma Registry (VSTR) and the National Coronial Information System (NCIS). Approval was obtained from The Alfred Human Research Ethics Committee.

2.2 Inclusion and exclusion criteria

Cases were eligible for inclusion if they involved a pedestrian injured in a collision with one or more vehicles on a road, street or highway, aged 18 years or over, in Victoria from January 1st 2009 to December 31st 2013. Intentional pedestrian injuries as determined by police, coroner or medical record documentation were excluded. As in-hospital deaths are included in VSTR and NCIS data sets, pedestrians who died in-hospital were excluded from NCIS figures to avoid duplication. Similarly, cases of PTI admitted to hospital from the emergency department (ED) were excluded from the VEMD data set to avoid double counting.

2.3 Data sets and procedures

2.3.1 VEMD

Data on all patients who presented to an ED were obtained from the VEMD. The VEMD collects data on all presentations to public hospital emergency departments in the state, and other hospitals as directed by the Department of Health and Human Services. Cases were identified using the search criteria: Injury cause "pedestrian", Place code "Road, street or highway", Human Intent "Non-intentional" and Age "18 years or over" over the study period. Data were extracted on patient age, sex, and separation mode.

2.3.2 VAED

The VAED was used to identify all hospital admissions for PTI. The VAED collects data on all admitted episodes to Victorian public and private hospitals and is managed by the Department of Health and Human Services, Victoria. Cases were identified using the ICD-10-AM codes V031, V039, V041, V049, V061, V069, V092, V093 and V099, which indicate PTI. Cases were included for completeness where categorisation as traffic or non-traffic was unspecified, as it was more likely that these were traffic-related, however this presumption cannot be tested with current data available. Data were extracted on patient age, sex, length of stay, number of hours in ICU, number of hours of mechanical ventilation and separation mode.

2.3.3 VSTR

The VSTR was used to identify all cases of pedestrian major trauma and in-hospital deaths. The VTSR collects data on all patients with an Injury Severity Score >12, all who require urgent surgery or intensive care unit admission for over 24 h and were mechanically ventilated after admission, and all deaths after injury. Cases were identified using the search criteria: Injury Cause "Pedestrian", Age "18 years or over", Injury Place "Road, street or highway" and Intent "Unintentional". Data were extracted on patient age, sex, type of type of vehicle causing injury, pattern and severity of injury, blood alcohol concentration and discharge disposition. Vehicle type was extracted by the data manager from text narratives. Blood alcohol concentration was only documented if recorded by hospital staff. Although section 56(2) of the Victorian Road Safety Act 1986 permits the taking of blood to test BAC by a doctor from pedestrians above 15 years of age brought to hospital

Table 1
Profile of PTIs in Victoria, Australia from 2009 to 2013 (*Out-of hospital deaths from 2009 to 2012).

Variable Total Number:	VEMD 1838	VAED 3241	Major Trauma 538	In-hospital deaths 90	Out-of hospital deaths* 122
Sex:					
Male	895 (48.7%)	1442 (55.5%)	306 (56.9%)	59 (65.6%)	82 (67.2%)
Female	943 (51.3%)	1799 (44.5%)	232 (43.1%)	31 (34.4%)	40 (32.8%)
Age (years)					
18–24	456 (24.8%)	596 (18.4%)	89 (16.5%)	5 (5.6%)	21 (17.2%
25–34	428 (23.3%)	605 (18.7%)	91 (16.9%)	12 (13.3%)	20 (16.4%)
35–44	285 (15.5%)	415 (12.8%)	62 (11.5%)	9 (10.0%)	21 (17.2%)
45–54	229 (12.5%)	348 (10.7%)	67 (12.5%)	5 (5.6%)	14 (11.5%)
55–64	179 (9.7%)	354 (10.9%)	59 (11.0%)	6 (6.7%)	15 (12.3%)
65–74	134 (7.3%)	365 (11.3%)	71 (13.2%)	15 (16.7%)	11 (9.0%)
75–84	52 (2.8%)	378 (11.7%)	74 (13.8%)	20 (22.2%)	16 (13.1%)
85+	75 (4.1%)	181 (5.6%)	25 (4.6%)	18 (20.0%)	4 (3.3%)
Vehicle type					
Motor car	–	2795 (86.2%)	403 (74.9%)	71 (78.9%)	38 (31.1%)
4WD	–	–	18 (3.3%)	5 (5.6%)	3 (2.5%)
Trains	–	–	3 (0.5%)	0 (0%)	35 (28.7%)
Pick-up truck or van	–	–	11 (2.0%)	1 (1.1%)	15 (12.3%)
Truck	–	140 (4.3%)	38 (7.1%)	5 (5.626%)	16 (13.1%)
Bus	–	–	11 (2.0%)	1 (1.1%)	3 (2.5%)
Motorcycle	–	–	11 (2.0%)	1 (1.1%)	–
Tram	–	–	21 (3.9%)	3 (3.3%)	2 (1.6%)
Agricultural vehicle	–	–	0 (0%)	0 (0%)	4 (3.5%)
Other	–	186 (5.7%)	7 (1.3%)	1 (1.1%)	6 (4.8%)
Unknown	–	120 (3.7%)	15 (2.8%)	2 (2.2%)	0 (0%)
Blood alcohol concentration					
≥0.05 g/100 mL	–	–	132 (24.5%)	9 (10.0%)	29 (23.8%)
<0.05 g/100 mL	–	–	27 (5.0%)	6 (6.7%)	1 (0.1%)
Detected but not quantified	–	–	4 (0.7%)	0 (0%)	0 (0%)
Not detected	–	–	217 (40.3%)	30 (33.3%)	92 (75.4%)
No test results available	–	–	248 (46.1%)	45 (50.0%)	(0%)

Please cite this article in press as: K.E. Charters, et al., Pedestrian traffic injury in Victoria, Australia, Injury (2017), https://doi.org/10.1016/j.injury.2017.12.014