Look right! A retrospective study of pedestrian accidents involving overseas visitors to London

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Title	**Look Right! A Retrospective Study Of Pedestrian Accidents Involving Overseas Visitors To London.**
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LOOK RIGHT! A RETROSPECTIVE STUDY OF PEDESTRIAN ACCIDENTS INVOLVING OVERSEAS VISITORS TO LONDON.

ABSTRACT

Introduction: Research within the European Union has shown international visitors to have a higher injury mortality rate than residents. Traffic accidents are the leading cause of injury-related death among overseas visitors and evidence suggests that overseas visitors are at increased risk of being involved in road traffic accidents than the resident population. However, there is little information that looks specifically at pedestrian injuries to overseas visitors, despite the fact that pedestrian deaths account for 21% of all UK road deaths.

Methods: A retrospective database review of London HEMS missions was undertaken to examine the number and type of missions to overseas visitors and to look specifically at pedestrian incidents.

Results: Of 121 missions to overseas visitors, 74 (61%) involved the visitor as a pedestrian struck by a vehicle. Thirty-five pedestrians (47%) were struck by a bus and 20 by a car (27%). 14 patients (19%) had an initial GCS of 3-8, suggesting severe head injury and half of all patients required pre-hospital intubation (38/74, 51%). The mortality rate was 16% (12/74) and sixty-two patients (84%) survived to hospital discharge. Of 39 patients admitted to The Royal London Hospital, the average Injury Severity Score was 23.0 (An ISS >15 denotes severe trauma). Twenty patients required surgery (20/39, 51%), nine of whom required neurosurgery (23%). Twenty-two patients required ICU treatment (56%) with a mean ICU stay of 7.6 days. The mean in-patient stay for all 39 patients was 17.9 days.

Conclusion: During the 7 year period studied, 61% of HEMS missions to overseas visitors involved a pedestrian being struck by a vehicle, compared with 16% of missions to UK residents. For HEMS missions, serious trauma to pedestrians is disproportionally more common among the visitor population to London.

INTRODUCTION

It is estimated that 15.6 million overseas visitors stayed in London in 2006.[1] The tourist population accounts for around 3.7% of the total London population [1,2] and is considered to be at greater risk of mortality than the domestic population. The average injury mortality of tourists to a sample of European Union countries in 2003 was 170 per 100,000 person years at risk, compared to 37 per 100,000 person years at risk for residents.[3] This amounts to around 3,800 injury related deaths of visitors to the European Union each year.[3] Research from the USA has shown that accidental injury is the second leading cause of death in the non-resident population and that road

traffic accidents comprise the largest subgroup.[4] Data from Austria and Greece reveal that 55% of injury-related deaths among international visitors are due to road traffic accidents.[3]

Previous research has shown that overseas visitors are more likely to be involved in road traffic accidents than residents. Motorcycle accidents among tourists to Bermuda were 5.7 times higher than residents [5] (although tourists are unable to hire cars on the island). A hospital in Corfu, Greece found that 40% of accidents among overseas tourists were due to road traffic collisions compared to 15% among residents.[6]

Several factors may account for why visitors are involved in traffic accidents, including lack of familiarity with traffic rules, reduced awareness and alcohol use. Anecdotal reports concerning injuries to pedestrians often describe 'looking to the wrong direction' as a major cause of accidents. Indeed, Winston Churchill was struck by a taxi after looking the wrong way in New York in 1931, sustaining fractured ribs and a scalp laceration.[7] However, there is little research that specifically looks at pedestrian injuries to overseas visitors. A recently published exploratory investigation using a virtual road crossing environment found that male pedestrians have a lower margin of error (calculated as a safety ratio) in crossing the road when traffic flows in an unfamiliar direction on first encounter.[8] This suggests that overseas visitors to London from countries that drive on the right may be at greater risk of pedestrian injury. 675 pedestrians were killed in road accidents in the UK in 2006 (1.1 per 100,000 population) accounting for 21 per cent of all UK road deaths.[9,10]

METHODS

A retrospective analysis of the London Helicopter Emergency Medical Service (HEMS) trauma database was undertaken to examine the number of incidents involving overseas visitors from 1st January 2000 to 31st August 2007. The aim of the review was to determine the number and type of incidents involving overseas visitors and to look specifically at pedestrian incidents. The term 'overseas visitor' has been used throughout this paper to reflect those visiting London for business or leisure purposes and because the term 'tourist' implies holidaymaker or sightseer. Overseas visitors were thus defined as those resident in another country and who were visiting London for business or leisure purposes. The study excluded immigrants resident in London, including those resident for business or study purposes.

Incidents were selected by searching the Area Health Authority details for patients listed as 'Overseas visitor'. Each record was then screened to include those recorded as staying at a 'care of' address, a London hotel, or who listed their home address overseas. For all overseas visitors involved in pedestrian incidents the database notes (completed by the attending doctor) were checked to verify country of residence (where detailed) and type of vehicle involved in the incident. Other search information included incident date and details, patient demographics, patient injuries, pre-hospital interventions, destination hospital and outcome.

RESULTS

During the period studied 9,571 HEMS missions were undertaken. Of these, 121 (1.3%) involved overseas visitors. Table 1 lists the type of incidents attended and shows the majority of missions (74/121, 61%) involved the visitor as a pedestrian being struck by a vehicle.

Incident Description	Total
Motor vehicle accident involving collision with pedestrian	**74**
Road traffic accident	11
Fall from standing or stairs/steps	6
Fall from or out of building or other structure	6
Other Fall (* defined below)	5
Passenger collision with railway rolling stock	4
Pedal cyclist accident (accidental fall or hit by motor vehicle)	3
Assault	2
Suicide / self inflicted injury	2
Jump from man made structure	2
Non-trauma	2
Other (+ defined below)	4

Table 1: Incident description for all HEMS missions to overseas visitors.

* Fall from one level to another (other); Fall in or from railway train, passenger; Fall into other hole or other opening in surface; Fall on same level as result of tackle in sport; Fall, undetermined, residential premises
+ Accident caused by hot substance or object, other; Accident while alighting or boarding vehicle, pedestrian; Jump or lying before moving object, undetermined accident or intent; Struck accidentally by falling object

Pedestrian Incidents

In 71 of the 74 incidents the pedestrian had stepped into the road and been struck by a vehicle. However, three incidents involved loss of control of a vehicle onto the pavement (sidewalk). The mean age of pedestrian casualties was 40.6 years (range 9 -93). Thirty nine pedestrians were male and thirty six female. Injured pedestrians were from 23 different countries and the USA had the highest number of casualties with 16 (21%). Of the 57 pedestrians for whom nationality was recorded, ninety five percent were from countries that drive on the right hand side of the road.

Figure 1 shows the type of vehicle involved in each incident. Nearly half of all incidents involved a collision with a bus (35/74, 47%). Twenty pedestrians (27%) were struck by a car.

Forty one incidents occurred within Central London (see table 2, below), nineteen of which took place in the popular tourist areas of Oxford Street, Oxford Circus, Piccadilly, and Leicester Square. Of the remaining accidents, 28 occurred within Greater London and location information was incomplete in 5 cases.

Street name	No. of casualties	Street name	No. of casualties
Oxford Street	7	Grays Inn Road	1
Piccadilly	5	Great Russell St	1
Oxford Circus	4	Parliament Square	1

Charing Cross Rd	4	Knightsbridge	1
Leicester Square	3	Buckingham Palace Rd	1
Tavistock Place	2	Bank	1
Victoria Street	2	New Street	1
Trafalgar Square	1	London Wall	1
Kingsway	1	Blackfriars Bridge	1
Russell Square	1	Tower Hill	1
Southampton Row	1	**TOTAL** (Central London)	41

Table 2: Incident location within Central London.

Fifty one percent of all pedestrian casualties (38/74) required pre-hospital intubation and fourteen of the seventy-four patients (19%) had severe head injury (initial GCS of 3-8).

Forty two patients were taken to The Royal London Hospital. Of these, two patients died in A&E on the day of the incident and one patient was discharged on the day of the incident. Of the 39 patients admitted to the Royal London Hospital, the average Injury Severity Score was 23.0 (range 1-54) (an ISS > 15 denotes severe trauma). Twenty one of the 39 in-patients (54%) suffered a base of skull fracture and 36% (14/39) suffered intra-ventricular or sub-arachnoid haemorrhage. Subdural haematoma, fractured facial bones and fractured ribs were each experienced by 13 of 39 patients (33%). Over half of patients required surgery (20/39, 51%), with nine patients requiring neurosurgery (9/39, 23%). Table 3 details the injuries sustained.

Twenty-two of the 39 in-patients required ICU support (22/39, 56%) with a mean ICU stay of 7.6 days (range 1 -28) and a mean total in-patient stay of 22.5 days. Of the 17 patients who did not require ITU support, the mean length of in-patient stay was 11.9 days (range 1-41).

Area	Injury Description	No. of patients
Head Injuries	Fracture base of skull	21
	Cerebral contusion	20
	Generalised SAH/IVH	14
	Subdural haematoma	13
	Fracture facial bones	13
	Scalp laceration	9
	Extradural haemorrhage	7
	Open face wound	7
	Other intercranial injury	6
	Fracture vault of skull	3
	Fracture cervical spine	2
	Concussion	1
Thoracic Injuries	Fracture ribs	13
	Lung contusion	6
	Pneumothorax	5
	Fracture clavicle	4
	Haemathorax	3
	Pneumohaemothorax	3
	Thoracic aorta tear	2
	Fracture scapula	1

Abdominal and Thoracic Injuries	Liver contusion	4
	Splenic tear	2
	Fracture lumbar spine	2
	Fracture thoracic spine	1
	Injury to bladder & urethra	1
	Injury to iliac blood vessels	1
Limb Injuries	Fracture tibia/fibular	6
	Fracture femur	3
	Fracture humerus	1
	Fracture malleolus	1
	Fracture metacarpal	1
	Shoulder dislocation	1

Table 3: Pedestrian Injuries (39 patients)

IVH/SAH: Intraventricular haemorrhage and sub-arachnoid haemorrhage

Of all 74 pedestrian casualties, sixty two survived to hospital discharge (84%). 12 patients did not survive (16%) and of these, 8 were struck by a bus (11%), 2 by a lorry (3%) and 1 each by a van and car (1.3%). Eight patients died on the day of the incident.

DISSCUSSION

The results reveal an interesting insight into the type of serious trauma attended by HEMS involving overseas visitors to London. 61% of HEMS missions to overseas visitors involved pedestrian collisions with vehicles. This is compared to 16.5% of missions to UK residents. HEMS missions involving serious trauma to pedestrians are disproportionally more common among the visitor population to London. Of the patients for whom nationality was recorded, 95% were from countries that drive on the right. From data available, it was calculated that approximately 80% of visitors to London are from countries that drive on the right [11] and the results suggest that this group are at increased risk of pedestrian accidents.

A number of reasons could account for the large proportion of buses involved in pedestrian incidents. London has one of the world's largest urban bus networks and there are many dedicated bus lanes in central London, the majority of which run perpendicular to the pavement (sidewalk). Any person stepping into the road therefore steps first into a bus lane rather than a general traffic lane. Eleven of the 74 incidents occurred on Oxford Street and Oxford Circus, on which traffic is restricted to buses, taxis and motorcycles. The high number of buses may also reflect the fact that HEMS attend serious trauma incidents and that buses may cause more severe injuries to pedestrians due to the high energy impact of collisions.

Road traffic accidents are an important public health concern and are predicted to be the third leading cause of death by 2020.[12] A large percentage of road deaths occur in pedestrians and with the number of international visitors to London projected to increase to 26.3 million by 2020 [1], prevention of such accidents is increasingly important.

Specific strategies are required to target overseas visitors. Pre-travel advice often concerns health aspects of travel but does not consider the risk of accidental injury. A good example of evidence-based visitor safety comes from the Australian National Visitor Safety Program, one of the main aims of which is to improve road safety. This program identifies target groups and provides materials to highlight the risks of accidental injury based on the number of international visitor injuries and fatalities obtained from hospital admission and other data.[13] The collection of such data is problematic, but vital in order to determine facts and allow development of prevention strategies.

It is worth considering that the cost of treating foreign visitors in the NHS each year is an estimated £62 million, over half of which is never recovered.[14] The UK has reciprocal healthcare agreements with European Economic Area Countries as well as a number of other specified countries. However, overseas visitors requiring hospital admission who fall outside exemptions are expected to pay for their treatment.

There are a number of limitations to this retrospective review. Firstly, the number of incidents attended by HEMS involving overseas visitors is very small in comparison to the total number of visitors to London. A comparison with incidents attended by The London Ambulance Service would have been interesting, but was not possible. Secondly, as a result of the study being confined to HEMS missions, the generalisability of findings is limited. For example, the types of incident attended and the severity of patient injuries may not reflect that of the overseas visitor group as a whole.

Whilst the authors postulated that looking to the wrong direction when crossing the road is a factor in pedestrian injury to overseas visitors, this was not examined and further research is required if the cause of pedestrian injuries is to be understood. Finally, any database analysis is limited by the quality and amount of data recorded. For example, some overseas visitors (e.g. those visiting the UK illegally) may not have been listed as 'Overseas visitor'. This information is gained solely by patient or relative disclosure. Two-thirds of the 9,571 patients attended by HEMS during the search period had no Area Health Authority registered on the HEMS database and this was used as the main search criteria. However, patients who are not registered with an Area Health Authority are recorded as UK residents and have UK addresses.

CONCLUSION

In the seven year period studied, 1.3% of HEMS missions were to overseas visitors, 61% of which involved pedestrian collisions with vehicles. The mean Injury Severity Score of pedestrians was 23.0 and the mortality rate was 16% (12/74). This research provides a snapshot of injuries sustained by international visitors to London. Further research and systematic data collection of injury and mortality to the visitor population is required to gain a greater understanding of the risks faced to international visitors and would allow the development of accident prevention strategies.

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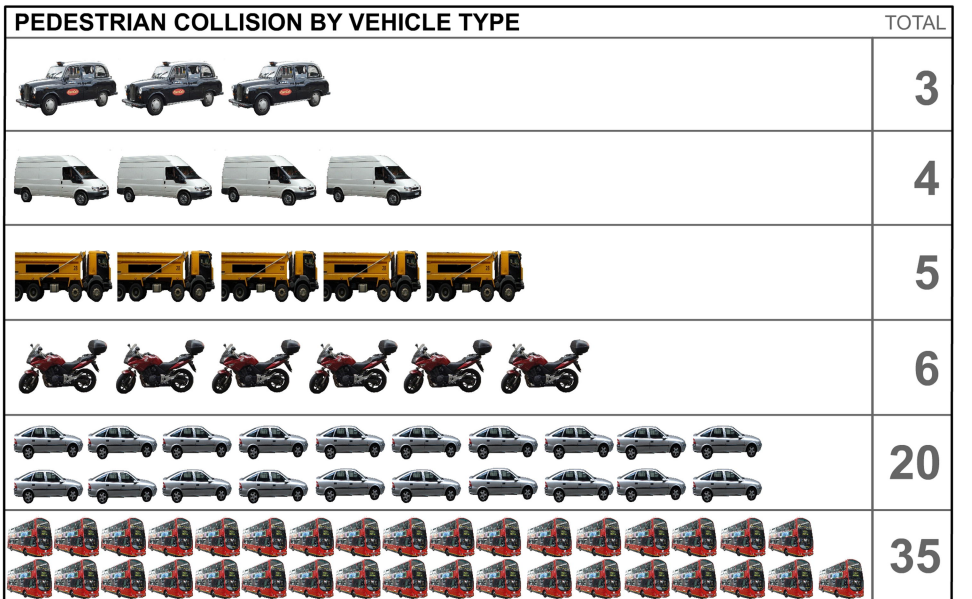
FIGURE 1



Note: Vehicle type not recorded in one incident.