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Trauma in the elderly in Trinidad and Tobago: a cross-sectional study

Ricardo Naraynsingh, Ian Sammy, Joanne F. Paul and Paula Nunes

Little is known about trauma in the elderly in the developing world. This study compared injuries in older patients with those in younger adults in a Third World setting. This was a prospective observational study of trauma admissions to a tertiary hospital in Trinidad, comparing injury characteristics and patient outcomes in older versus younger adults. Falls were the most common mechanism of injury in the elderly, accounting for 71% of injuries. Older patients who fell sustained fractures more often and were most likely to injure the limbs and head. Elderly patients were more likely to be admitted to hospital. Trauma in the elderly in Trinidad is similar to that in the developed world. Public health measures in developing countries should be aimed at preventing falls in older persons. The burden of trauma in the elderly is likely to increase in developing countries as the population ages. ***European Journal of Emergency Medicine*** **00:000–000 © 2014 Wolters Kluwer Health | Lippincott Williams & Wilkins.**

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lty of Medical Sciences, The University of the West Indies, St Augustine, dad and Tobago

Correspondence to Ian Sammy, FFAEM, Faculty of Medical Sciences, The University of the West Indies, St Augustine, Trinidad and Tobago
Tel/fax: +868 663 4319; e-mail: sammyian62@gmail.com

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Introduction

Little is known about the causes and outcomes of trauma in the elderly in the developing world. The elderly population is increasing globally; by 2050, 20% of the population of Trinidad and Tobago will be 65 years or older [1,2], and trauma is the fifth most common cause of death in patients 65 years or older.

Although much research has been conducted into the epidemiology of trauma in older persons worldwide, this has focused on Europe and North America [3,4]. The few published studies on elderly trauma in the Third World have come from relatively developed and affluent settings such as Hong Kong and Brazil [5,6]. We therefore conducted an observational study of trauma patients presenting to the Emergency Department (ED) at San Fernando General Hospital, Trinidad and Tobago, comparing patients aged 65 years and over with those aged 18–64 years.

Methods

The study was a prospective observational study of all trauma patients presenting to the ED of San Fernando General Hospital over a 1-month period (from 1 May to 31 May 2009, inclusive). Patients were identified from the ED admissions register, from a dedicated trauma register kept in the ED and from the hospital mortuary register. Additional patient information (including age, sex, ethnicity, mechanism of injury, injury pattern and type of injury) was obtained from clinical records. ICD10 codes were determined for all injuries, and abbreviated injury scores were calculated from the ICD10 codes.

All patients 18 years and over presenting to the ED with a chief complaint of trauma were included. Patients whose main complaints were not trauma related, and those aged less than 18 years, were excluded. Patients brought directly to the mortuary of San Fernando General Hospital after trauma were also excluded, as the hospital accepts deceased patients for postmortem examination from outside of its normal catchment area.

Patients aged 65 years or older were compared with those aged 18–64 years, in relation to injury characteristics (injury mechanism, site, pattern and type), demographic data (age, sex and ethnicity), injury severity and clinical outcome. Statistical significance of any differences between groups was ascertained using χ^2 analysis.

Ethical approval for this study was obtained from the ethics committee of the South Western Regional Health Authority. All patient information was anonymized at the time of data collection and all data were securely stored.

Results

During the study period, 1052 patients were entered into the study. Of them, 111 were aged 65 years or older and 941 were aged 18–64 years. There were significantly more female patients in the older age group of trauma patients (Table 1). The ratio of the two main ethnic groups (Indo-Trinidadian and Afro-Trinidadian) was the same in both age groups.

Overall, older patients were more likely to sustain more severe injuries (Table 2). This trend towards more severe injuries in older patients was observed in injuries to the head, chest and upper and lower limbs. With respect to

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Table 1 Demographics, mechanism of injury, injury pattern and outcome of patients presenting to the San Fernando general hospital with a history of trauma ($n = 1052$)

	n (%)		
	18–65 years	≥65 years	*P* value
Total	941	111	
Sex			<0.001
Male	636 (67.5)	49 (44.1)	
Female	305 (32.5)	62 (55.9)	
Ethnicity			<0.001
Afro-Trinidadian	387 (41.2)	43 (38.7)	
Indo-Trinidadian	445 (47.3)	57 (51.4)	
Mixed	101 (10.7)	5 (4.5)	
Other	1 (0.1)	3 (2.7)	
Not recorded	7 (0.7)	3 (2.7)	
Mechanism of injury			0.001
Accident	517 (54.9)	95 (85.6)	
Assault	250 (26.6)	10 (9.0)	
Motor vehicle crash	172 (18.3)	6 (5.4)	
Deliberate self harm	2 (0.2)	0 (0)	
Site of injury			0.651
Total injuries	1314 (100)	141 (100)	
Head	409 (31.1)	42 (29.8)	
Neck	56 (4.3)	6 (4.3)	
Chest	94 (7.2)	12 (8.5)	
Abdomen/back/pelvis	103 (7.8)	11 (7.8)	
Upper limb	336 (25.6)	32 (22.7)	
Lower limb	316 (24.0)	38 (26.9)	
Outcome			0.005
Discharged	533 (56.7)	53 (47.7)	
Referred to specialist	404 (42.9)	57 (51.4)	
Died	4 (0.4)	1 (0.9)	
Referral patterns			0.009
Total number referrals	404 (100)	57 (100)	
Orthopaedics	195 (48.3)	37 (64.9)	
Surgery	19 (4.7)	4 (7.0)	
Neurosurgery	50 (12.3)	11 (19.3)	
ENT	42 (10.4)	3 (5.3)	
Medicine	8 (2.0)	0 (0.0)	
Ophthalmology	69 (17.1)	2 (3.5)	
Other	21 (5.2)	0 (0.0)	

injuries to the neck, abdomen, pelvis and back, younger patients sustained more severe injuries.

Older patients were more likely to sustain accidental injuries, whereas in younger adults motor vehicle collisions and assaults were more common (Table 1). Seventy-nine of the 95 elderly patients with accidental injuries suffered falls, compared with 251 of 517 younger adults ($P = 0.001$). Falls accounted for 71.2% of all elderly trauma, compared with 26.7% of trauma in younger patients ($P = 0.001$). Seventy-five falls in the older patients (94.7%) were low-energy injuries (falls from standing rather than falls from a height). In comparison, 201 of the 251 younger adults who had fallen (79.6%) suffered low-energy falls ($P = 0.001$).

The anatomical injuries sustained from all mechanisms of trauma were similar in both age groups (Table 1). Apart from the relation between all trauma and injury pattern, a subgroup analysis of those patients sustaining falls was also undertaken, to identify any specific relation between falls, age group and anatomical injury. For patients who suffered falls, the most common injuries were lower limb (43% of young adult fallers vs. 35% of older fallers), upper limb (25 vs. 19%) or head injuries (17 vs. 26%) ($P = 0.686$). Older adults were significantly more likely to sustain fractures from their falls compared with younger adults (39 vs. 25%; $P = 0.002$).

The number of injuries suffered by all patients was similar in both age groups. However, within the subgroup of patients presenting after a fall, older patients were significantly more likely to suffer more than one injury. In younger adults, 233 (93%) suffered an isolated injury after a fall, whereas the number sustaining two or more injuries was 18 (7%). In older patients, these figures were 68 (86%) and 11 (14%), respectively ($P = 0.006$).

Older patients were significantly more likely to be admitted following trauma compared with younger trauma victims (51.4 vs. 42.9%; $P = 0.005$). The patterns of referral were also significantly different between older and younger trauma victims. Older trauma patients were more likely to be referred to orthopaedics or neurosurgery, whereas younger patients were more likely to be referred to ophthalmology or ENT (Table 1).

During the study period, a total of five patients presenting to the ED with trauma died before leaving the

Table 2 Distribution of abbreviated injury score by age group and anatomical region injured ($n = 1455$)

		Distribution of injury severity [*n* (%)]			
Anatomical region	Age (years)	AIS < 3	AIS ≥ 3	Total	*P*-value (Pearson χ^2)
Head ($n = 451$)	<65	381 (93.1)	28 (6.9)	409	$P = 0.004$
	≥65	34 (81.0)	8 (19)	42	
Neck ($n = 62$)	<65	50 (89.2)	6 (10.8)	56	$P = 0.007$
	≥65	6 (100.0)	0 (0.0)	6	
Chest ($n = 106$)	<65	87 (92.6)	7 (7.4)	94	$P < 0.001$
	≥65	9 (75)	3 (25)	12	
Abdomen, back and pelvis ($n = 114$)	<65	92 (89.3)	11 (10.7)	103	$P = 0.007$
	≥65	11 (100)	0 (0.0)	11	
Upper limb ($n = 368$)	<65	331 (98.5)	5 (1.5)	336	$P = 0.006$
	≥65	29 (90.6)	3 (9.4)	32	
Lower limb ($n = 354$)	<65	306 (96.8)	10 (3.2)	316	$P < 0.001$
	≥65	26 (68.4)	12 (31.6)	38	
All injuries ($n = 1455$)	<65	1247 (94.9)	67 (5.1)	1314	$P < 0.001$
	≥65	115 (81.5)	26 (18.5)	141	

department, including four patients aged 18–64 years and one aged 65 or older. During this time, a further 16 patients were admitted to the mortuary with a primary diagnosis of trauma. Of ~~them~~, 14 were aged 18–64 and two were aged 65 or older. These patients were a combination of patients brought directly to the mortuary following death before hospital admission and patients who died on the wards after admission from the ED.

Discussion

In this study, the most common mechanism of injury in older trauma patients presenting to the ED was falls, and these patients were more likely to suffer injuries to their lower limbs and head, sustain fractures and be admitted to hospital. These findings are similar to those of other studies on trauma in older patients [3,4,7]. However, falls were more prevalent as a mechanism of injury in this study compared with previous studies, in which they accounted for between 64 and 70% of all elderly trauma cases [3,4,8]. Motor vehicle crashes (MVCs) accounted for less than 10% of elderly trauma cases, less than that reported in other studies. For example, Gowing and Jain [7] reported that 27% of elderly trauma cases were as a result of MVC. This relatively low incidence of MVCs in this study may indicate less independence in the elderly population in Trinidad, reducing the opportunities for involvement in MVC. This hypothesis is supported by the finding in this study that older patients were more likely to sustain their injuries at home.

There was no difference in injury patterns between older and younger trauma patients in this study. Injuries to the limbs and head were most prominent, followed by injuries to the chest. These patterns have been seen in other studies [3,4,7,8].

The higher incidence of fractures and multiple injuries after falls in elderly patients seen in this study has been documented previously. Spaniolas *et al.* [9] found an increased mortality following falls in the elderly, and both lower limb fractures and intracranial haematomas were common. Other studies have found increased injury severity, despite less severe mechanisms of injury in the elderly – a pattern that was also noted in this study [7,8, 10].

There was a higher admission rate in our elderly patients, a phenomenon noted by other authors. The greater demand on healthcare resources caused by elderly trauma is of concern in Third World economies with limited resources [5,8]. This burden is set to increase and needs careful management. In our study, the referral patterns for older patients also coincided with their injuries. Older trauma patients were most likely to be referred to either the orthopaedic or neurosurgical services, as these were the most common injuries they suffered. Younger adults were more likely to be referred to ophthalmology/ENT because of the prevalence of corneal foreign bodies sustained at work.

Unfortunately, the data on trauma mortality presented in this paper are unlikely to reflect the true mortality rates for trauma in the population studied. On the one hand, deaths occurring in the ED are likely to be an underestimation of the total number of deaths in trauma patients (as some would have died following transfer from the ED). In contrast, trauma-related deaths identified from mortuary records are a combination of ward deaths, deaths from the ED and deaths from out of hospital (which would have included some deaths from outside of the catchment area of this study). As such, mortality rates quoted in the results section should be interpreted with caution.

This study provided a useful insight into trauma in older patients in Trinidad. However, it was a single-centre study conducted over a restricted time frame (1 month). This may have biased results, although the hospital surveyed serves a catchment area that broadly reflects the population makeup of the island as a whole. In addition, there is little seasonal variation in temperature and weather in this tropical setting, and thus temporal variations in trauma are less likely compared with a temperate country. Further research is planned into the underlying risk factors for falls in elderly patients in Trinidad.

The study demonstrates a need for public education campaigns for the prevention of falls in the elderly in Trinidad, which may be applicable to other similar settings.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

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