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Trip, Slip and Fall: ICD10 and Fall from Height

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Abstract

Background: ICD 10 has unified the diagnosis, in this study, we have studied fall from height as per ICD 10 classification of cases who reported to emergency department of tertiary care hospital in Maharashtra. Unintentional fall from height represents a significant cause of injury in urban populations.

Results: In this retrospective study, data pertaining to cases which were examined and treated at a tertiary care centre in Western India was analysed from 2014-2016. A total of 44 cases qualified our criteria of unintentional fall from height.83% of the population study were male. 21-40 years of age were most commonly affected. Alcohol was a common factor amongst the falls. As the year progressed number of cases have decreased. W10 ICD 10, fall from stairs were the most common cause of fall. Head injuries (42%) followed by extremities injuries were the most common.

Conclusion: A significant number of non – fatal cases occur due to unintentional fall from height. There is a need to study the demographic profile of injured persons, assess the severity of their injuries and identify certain risk factors associated with such non-fatal injuries due to fall from height.

Keywords: *Fall from height, ICD 10, falls*

Background

A fall is defined as an event which results in a person coming to rest inadvertently on the ground or floor or other lower level [1]. They are coded as W00-W19 in ICD-10 [1,2]. Trauma is a leading cause of morbidity in young adults. Amongst the causes of trauma, falls are the most common mechanism of injury [3,4,5]. It accounts for 40 to 60% of all traumatic injuries [5]. It has been studied that approximately 60% of falls are accidental, 20% are intentional, and 20% are crime related [6,7].

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Methods

The study was conducted in Department of Forensic Medicine and Toxicology in Western Maharashtra over two years 2014-2016. A total of 44 cases were studied according to ICD-10 classification of fall from height. The data was collected from the Emergency and Trauma register

in the Emergency department of Tertiary health care center in Western Maharashtra, India. The data was collected in an excel sheet in terms of name, age, sex, time of fall and type of fall according to ICD 10. Data was thus studied and analysis of ICD 10 code for injuries was done.

Results

Table 1: Origin of the fall and distribution of the age of the patients according to the ICD 10 Classification

ORIGIN OF FALL	AGE GROUPS								TOTAL	%
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	>71		
W01	1	1	1	2	1	1	1		8	18%
W06	1					1		1	3	7%
W07							2		2	5%
W10	1	1	3	2	1	4	1		13	30%
W12			1	2		1			4	9%
W13			1						3	7%
W14			1	1		3			5	11%
W17			1	1	2		1	1	6	13%
TOTAL									44	100

Table 2 showing the admission of patients in different wards.

ADMISSION	MALE		FEMALE		TOTAL
	NO	%	NO	%	
WARDS	18	82%	4	18%	22
ICU	9	82%	2	18%	11
OPD	7	78%	2	22%	9
TOTAL	34	100	8	100	42

Table 3 showing the fracture and closed head injury sustained by the 44 patients of non fatal fall from height.

Cause of fall	Injury (fracture, closed head injury) grievous hurt						Total	
	Head	Neck	Upper limb	Lower limb	Spine	Back	Number	%
W01	3		1				4	10
W06	3						3	7
W07				1			1	2
W10	8	4		2	2		16	40
W12								
W13								
W14			5		1	1	7	18
W17	1		2	6			9	23
Total	15	4	8	9	3	1	40	100

Table 4 showing the simple and grievous hurt sustained by the 42 patients of the non-fatal fall from height.

Region	Hurt	Number	%	Total	%
REGION	HURT			TOTAL	
		NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
Head	Simple	28	65%	43	42%
	Grievous	15	35%		
Neck	Simple	2	33%	6	5%
	Grievous	4	67%		

Cont... **Table 4 showing the simple and grievous hurt sustained by the 42 patients of the non-fatal fall from height.**

Upper limb	Simple	15	65%	23	23%
	Grievous	8	35%		
Lower limb	Simple	14	61%	23	23%
	Grievous	9	39%		
Spine	Simple	0	-	4	4%
	Grievous	4	100%		
Chest	Simple	1	100%	1	1%
	Grievous	0	-		
Back	Simple	2	100%	2	2%
	Grievous	0	-		
Total		102	100	102	100

Discussion

In our study out of 44 patient's, 83%(37) of the cases were male who suffered non-fatal fall from height and 17%(7) were females. In 2014 a total of 18 cases(42%) fitted our criteria, 2015- 19(46%) and in 2016-7(12%) of the cases were studied.

The most affected age group in our study was in 21-40years of age constituting 38% of the patients and then 51- 60(10) years constituting 24% of the cases. Falls due to slips, trips and falls constituted 19% (8) of the total cases. Falls from one level to another constituted 14% (6) of the total cases. 90% of the falls were non- occupational in nature and 10% were of occupational nature. Injuries were simple(61%) and of grievous(39%) nature. 42% sustained injuries of head and 46 % sustained injuries to extremities.

ICD 10 data used in our study are as follows [2]W01: Slip trips and stumbling, W06: Fall from bed, W07: Fall from chair, W10: Fall from stairs and steps, W12: Fall from scaffolding, W13:fall from building or structure, W14: Fall from tree, W17: other fall from one level to another.

Children constituted 7 % of the population and the injuries they sustained were due to slips and trips, fall from bed and stairs. Injuriesmostly sustained varied with the height of the fall. Injuries sustained were upper limb fracture and head injury. 66% of the children population of the study population had hospitaladmission(wards).In many large studies, falls are the leading mechanism of unintentional

injury for children and young adults[8, 9]. Landin et al [10]found in young children (< 5 years of age) falls were the most common trauma. After the age of 4th year activity of the child and environmental factors became more important. Skull fractures were more common in young children and humerus fracture were seen in children < 4 years of age[4].

The long bone fracture rate was significantly higher in the children compared with both the infant/ toddler and the adolescent/young adult groups [4].The immature skeleton has a higher proportion of cartilage, making it less susceptible to fracture[11,12,13] . Curry et al. conducted a series of experiments comparing age-related mechanical properties of bone and found that compared with adult bone, the bone of children has a lower bending strength, modulus of elasticity, and mineral content[14,15].

Patients with head-first impacts sustain head and upper extremity injuries 6. In children, the head-first landing position is the most common[16] . The increased head-to-body weight ratio found in children moves the centre of gravity in a cephalad direction and adultsattempt to right themselves into a foot-first landing position.21- 40 years constituted 38%(16) of our study population.83%(15) of the population was male.43% sustained grievous injuries. 18%(3) were admitted to ICU.18%(3) were of occupational nature. One case was diagnosed as case of alcoholic dependence syndrome.31%(5) sustained limb injuries. 43%(7) suffered head injury.69%(11) had hospital admission. We had four patients who were under psychiatric follow up. Three cases(75%) were known cases of alcoholic dependence and one case (25%) was a known case of depression.

Most of the non-fatal injuries involved the upper and lower extremities for employer reportedand ED-treated non-fatal injuries[17] . Lapostolle et al[16] concluded in their study that adults are more prone to limb injuries. In our study however 43% of our study population had head injury and 31% had limb injury. Male preponderance was similar to other studies[18, 19]. 16% of our study population were over the age of 60 years and sedentary by nature. 100% of the injury recorded in >60 years of age were of grievous nature with hospital admission.

Behavioural risk factors include those concerning human actions, emotions or dailychoices. They are potentially modifiable. For example, risky behaviour such as the intake of multiple medications, excessalcohol use, and sedentary behaviour[20,22,23]. In our study 9% of the population was under medication by a psychiatrist. Alcohol dependency was recorded in 75% of the cases with psychiatry evaluation done.

Conclusion

The basis of the study is the preventive measures that can be taken to decrease the morbidity caused due to falls in a developing country. Falls are a leading cause of injury. Commonly the young and the working age group are commonly affected due to falls sustaining injuries to head and extremities. Most of the studies are done studying the mortality due to unintentional fall from height. Morbidity due to fall from height is rarely studied. ICD 10 has unified the diagnosis and helps in statistical analysis which may help in formulating guidelines to prevent slip, trips and falls.

Ethical Clearance: a prior approval was obtained from the Institutional Ethical Committee: IEC/2016/Feb/AFMC/FMT

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Conflict of Interest: Nil

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