

Falls From Residential Buildings In The Tabuk Area: Review Of 50 Patients

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Citation

T Suliman, A Ahmad. *Falls From Residential Buildings In The Tabuk Area: Review Of 50 Patients*. The Internet Journal of Orthopedic Surgery. 2005 Volume 3 Number 1.

Abstract

Objectives: To study the pattern of falls from residential buildings in Tabuk area ,and to know the details of the patients characteristics as for age, gender and reason of falls, aiming at reduction or prevention of such accidents.

Design: This is a prospective hospital based epidemiological study, in which the first fifty consecutive patients presented to the surgical emergency department who fell from windows and balconies were studied.

Results: The majority of cases were children (66%),males most commonly affected(82%).Most of the accidents occur in the evening (50%). 80% of patient fell from heights of less than 5 meters. Common injuries were fractures of the upper limb(24%),followed by lower limb fractures (16%), then head injuries in the third place(12%). Almost all patients were Saudis. Most of the patients were students below University level (48%).

Conclusion: Falls from balconies and windows is a common problem in Tabuk area with some serious injuries. Most of the victims were school children. Safety measures to balconies and windows, and health education of parents and to children at schools may help reducing this preventable accidents.

INTRODUCTION

Domestic accidental falls from balconies and windows is a major cause of morbidity and mortality worldwide^{1,2,3},especially among children. Marilyn et al., found that nearly 140 children below 15 years of age die each year because of falls fro balconies and windows in the USA².Although it is agreed that unintentional falls is a preventable condition^{4, 6},its incidence remains high⁵,and it receives little attention in most countries compared to road traffic accidents. Studies on road traffic accidents started here in Saudi Arabia as early as 1988,by Bener et al⁷,and there are as many of them published to-date, compared to only two studies, with our limited search of the literature, regarding falls from heights^{8,9}.

This motivated and encouraged us to carry out this study, especially when we noticed the increase in the number of such cases treated each week in our hospital. We hope that our study will through more light and draw more attention to this rising problem ,and to stimulate other centers to carry out similar studies aiming at its prevention.

PATIENTS AND METHODS

This is a prospective hospital based epidemiological study conducted in King Khalid Hospital in Tabuk, where the first fifty cases of accidental falls from residential areas in Tabuk region treated in the emergency department during the middle 4 months of year 2004 were studied. Only those accidentally fell from balconies and windows, were included in this study. All cases of slippery on the floor or falls from other objects were excluded. Also, all suicidal falls were excluded. We visited some of the residential areas in the city and examined the widows and balconies, and observed the behavior of some children in these places. The collected data analyzed and categorized as shown in the results below.

RESULTS

The total number of patients included in this study was 50.Males were the majority, 41(82%),and females were 9 (18%).(table 1).

Figure 1

Table 1: gender (sex distribution) of patients.

male	female	total
41(82%)	9(18%)	50(100%)

Figure 2

Table 2: age distribution of patients.

Age	No. of patients
<5years	15(30%)
5 – 10	14(28%)
10-15	04(8%)
15-20	03(6%)
20-25	00(00%)
25-30	02(4%)
30-35	00(00%)
35-40	08(16%)
40-45	01(02%)
45-50	00(00%)
> 50	03(06%)
Total	50(100%)

Figure 3

Table 3: Nationality of patients.

Saudi	Non-saudi	Total
45(90%)	05(10%)	50(100%)

Figure 4

Table 4: time of injury to patients.

Time of injury	No. of patients
01-05pm	18(36%)
05-10pm	07(14%)
03-05am	05(10%)
Unknown	20(40%)
Total	50(100%)

Age of patients (table 2): 33 (66%) of patients were children below 15 years of age. Most of patients were Saudis (90%), as shown in table 3. The time of injury was found to be between 1 – 5 pm in the majority of cases (table 4), followed by the evening hours. Most of the studied cases (52%) fell from a height of less than 3 meters, from windows, (table 5). 14(28%) patients fell from first floor balcony (3-5 meters), and 6 (12%) patients fell off the second floor balcony (5-7meters). Four patients the level from which they fell was not known.

Figure 5

Table 5: level of height from which patients fell.

Height(meters)	No. of patients
<3	26(52%)
3-5	14(28%)
5-7	6(12%)
Unknown	4(8%)
Total	50(100%)

Of the fifty patients included in this study, 24(48%) were pre-college students. Two were illiterate adults, and the majority 15 (30%) were of preschool age, (table 6).

As shown in table 7, limb fracture constitutes the majority of injuries, 20 (40%), followed by head injury (12%), then fracture spine(8%) Fig1. Eight patient (16%) sustained no serious injury. The least type of injuries was fracture of the pelvis and palatal hematoma (one patient each).

Figure 6

Figure 1: Fracture body of vertebra.



Only one patient (2%) with fracture of the base of the skull died.

DISCUSSION

Since the discovery of oil in The Kingdom of Saudi Arabia, it became one of the fastest growing and advancing countries in the world. This includes, among the various aspects of

life, an increase in multistory residential buildings in and around towns and cities, which brought to light an increasing number of unintentional falls from balconies and windows of these buildings. Unfortunately, this problem of falls from heights received little attention from clinicians compared to road traffic accidents, another new problem arrived with the exponential advance and growth of this country. While studies regarding road traffic accidents started in 1980s by Bener et al, ⁷, followed by overwhelming number of articles in the same subject, only few papers were written about falls from height, in fact we could retrieve only two such papers with our limited search of the literature ^{8,9}.

Falls from residential buildings is a worldwide problem, causing serious morbidity and death among the community, especially children^{1,2,6,10}. Its treatment is costly and exhausts the resources of health authorities^{2,11}.

The majority of our cases were of Saudi nationality, 90% of the total, which matches results of previous similar studies, ⁸. This is explainable as the study was conducted in Saudi Arabia. As in almost all similar studies regarding this problem, we found that males dominated the number among the victims,^{2,3,4,8,9,10,12,13}. This because males tend to play more common and more aggressive than females especially children, who constitute the majority of our subjects,66%,conforming with the results of other studies ^{1,3,5,8,10,14,15,16}. In our study, 17 (34%) were adults,3 of them over 50 years of age and they fell during early morning due to lack of clear vision due to dim light and vision problems, most of other falls (36%) occurred in the early evening between 1pm to 5pm, the time of maximum playing among children during the time of the study when most of them were in summer vacation. This is similar to the results of Talal et al,⁸done in Asir in 1995, and to other international results of similar studies, ^{1,2,9,16,17}.

Most of our patients (52%) fell from windows of a height ranging from 1to 3meters, followed by 28% who fell from first floor balconies ,and 12% from second floor balcony, with no case from third floor balcony or windows as there very few residential buildings which are of more than three stories in Tabuk area, as is the case in most of the cities and towns in the Kingdom. Similar distribution of number of falls per each height was noticed in previous studies^{1,3,4,5,8,10,11,15}. The balconies of the apartments we examined has low walls and no guarding rails, and the windows opens flush with the outer walls of the rooms, with no guarding rails or window balconies, which may explain

the likelihood of children being falling from them. Although some authors recommended these protective rails to be added to balconies and windows, ^{2,4,5},others regard this is against the fire safety measures as any fixed rails in these areas will impede exit of inhabitants in case of fire, ². Moreover, we noticed that some children lean forward over the walls of these balconies and out of the windows, which put them in danger of falling. Interesting enough we noticed some children practice skating on the floor of these balconies, sometimes very speedy.

We included in our study the level of education of these patients, and noticed that none of them received higher education beyond secondary school level. The majority were at preschool age15(30%),followed by those at primary school level 13 (26%),followed by secondary school students 8 (16%), then intermediate school 3 (6%).Only two patients were illiterate, (table 6).

Figure 7

Table 6: level of education of patients.

Level of education	No. of patients
None(illetrate)	2(4%)
Preschool	15(30%)
Primary school	13(26%)
Intermediate	3(6%)
Secondary	8(16%)
Unknown	9(18%)
Total	50(100%)

We couldn't find any similar data about the level of education in the literature. Despite the few numbers studied ,we may regard the level of education as a factor in preventing such incidents, as none of the victims received higher education.

Fracture of long bones was found to dominate the type of injury in our study, with the upper limb bones fractured in 12(24%) of patients, and the lower limb bones fractured in 8(16%) cases. The next common injury was head injury in 6(12%) patients, (table 7).

Figure 8

Table 7: Types of injuries.

Type of injury	No. of patients
Upper limb fracture	12(24%)
Lower limb fracture	8(16%)
Head injury	6(12%)
Fracture spine	4(8%)
Fracture pelvis	1(2%)
Palatal hematoma	1(2%)
No injury	8(16%)
Total	50(100%)

The pattern and distribution of these injuries in our study are

similar to other studies,^{10,11,15} but others found

that head injury was the dominant type of injury^{2,3,8}. This difference in the dominating type of injury couldn't be explained.

Compared to the study done by Talal et al⁸, in 1995, we can see clearly that the incidence of falls from heights is rising, especially among children, despite the fact that it is a preventable condition. We agree to the recommended measures for prevention stated by others, which includes health education to parents and children, safety measures in housing design and building.^{2,3,8,9,13,18}

In conclusion, falls from windows and balconies in residential areas in Tabuk region is in increase and causing considerable threat to health and life of the community, especially children. To know the magnitude of the problem, more comprehensive studies based on the community is needed, which will lead to more clear and effective preventive measures.

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