

INJURY UPDATE

*A Report to Oklahoma Injury Surveillance Participants**

February 22, 2006

Traumatic Brain Injuries Resulting from Falls on Stairs/Steps in Oklahoma, 1992-2003

INTRODUCTION

Falls are the second leading cause of unintentional injury death for people of all ages and the leading cause for people 60 years and older in the United States. One in three adults aged 65 years and older falls annually. Also, children and youth (<1 to 14 years) are at high risk for falls and accounted for 27% of non-fatal falls in the home. Falls are the most costly injury among older persons in the United States.

In Oklahoma, there were 12,173 hospitalized or fatal traumatic brain injuries that resulted from a fall from 1992 to 2003. This report describes the occurrence of falls on or from stairs/steps and the demographic and epidemiologic factors associated with these injuries. Falls on or from stairs/steps were defined as those resulting from going up or down any stairs/steps. Children who fell from their caregiver's arms as they went up or down stairs/steps and elderly who fell from their wheelchair onto stairs/steps were excluded. Specific recommendations of prevention are made based on the data, case briefs, and consideration of effective ways to reduce falls on stairs and their long-term consequences.

DESCRIPTIVE EPIDEMIOLOGY

Based on surveillance data collected on persons who were hospitalized or died from a traumatic brain injury in Oklahoma from 1992 to 2003, a total of 505 (4%) injuries resulted from falling on or from stairs/steps.

The ages of injured persons ranged from less than one to 104 years with the highest number and rate of injuries among adults 65 years or older (48%, 4.5 per 100,000 population). Children less than five years old had the second highest number of injuries (11%, 2.0 per 100,000 population) (Table 1).

Table 1. Traumatic Brain Injuries Resulting from Falls on Stairs/Steps, by Gender, Age Group, and Race, Oklahoma, 1992-2003

Characteristic	Number	Percentage	Rate per 100,000
Gender			
Male	263	52%	1.0
Female	242	46%	1.0
Age Group			
0-4	56	11%	2.0
5-14	23	5%	0.4
15-24	24	5%	0.4
25-34	28	5%	0.5
35-44	36	7%	0.6
45-54	52	10%	1.0
55-64	45	9%	1.2
65+	241	48%	4.5
Race			
White	439	87%	1.3
African American	27	5%	0.8
Native American	20	4%	0.6

*The INJURY UPDATE is a report produced by the Injury Prevention Service, Oklahoma State Department of Health. Other issues of the INJURY UPDATE may be obtained from the Injury Prevention Service, Oklahoma State Department of Health, 1000 N.E. 10th Street, Oklahoma City, Oklahoma 73117-1299, 405/271-3430 or 1-800-522-0204 (in Oklahoma). INJURY UPDATES and other IPS information are also available at www.health.state.ok.us/program/injury.

Rate of injury occurrences were higher among males than females in all age groups (Figure 1). Whites had the highest rate of injury (1.3 per 100,000 population) followed by African Americans and Native Americans (0.8 and 0.6 per 100,000 population, respectively). Of the 209 survivors with reported time of injury, 65% occurred between 1:00 and 9:00 pm (Figure 2). Among the survivors who were 15 years or older, 18% were reported drinking alcohol and 2% using drugs prior to injury. Of the 126 cases with known location where injuries occurred, 79% were at home.

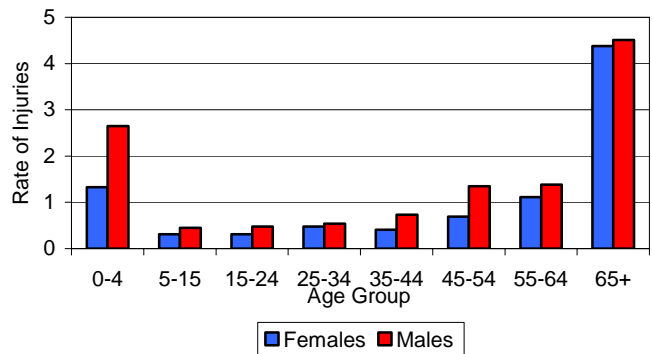
Of the 505 injured persons, 15% died; 67% of persons who died were 65 years or older. Among survivors, 70% were discharged home, 10% to a rehabilitation/psychiatric facility, 9% to a skilled nursing facility, 4% to home health care, 3% to a nursing home, and 4% to another or unknown destination. Sixty-four percent of survivors spent four or less days in the hospital. The number of days spent in hospital ranged from one to 65 with a median of three days. Persons 65 years or older spent more days in hospital (median of 4 days) compared to younger persons (median of 2 days).

Supplemental medical information was collected in 1992-2000 on 293 injury survivors. Of these, 81% had a CT scan test, 51% suffered loss of consciousness, and 26% had post-traumatic amnesia. Fifty-five percent of the CT scan tests were abnormal. Fifty-three percent had an intracranial lesion and 22% had a skull fracture. Information on the severity of injury was collected on 291 survivors. Of these, 55% were moderate (AIS = 2), 15% were serious (AIS = 3), 23% were severe (AIS = 4), and 6% (AIS = 5) were critical.

CASE BRIEFS

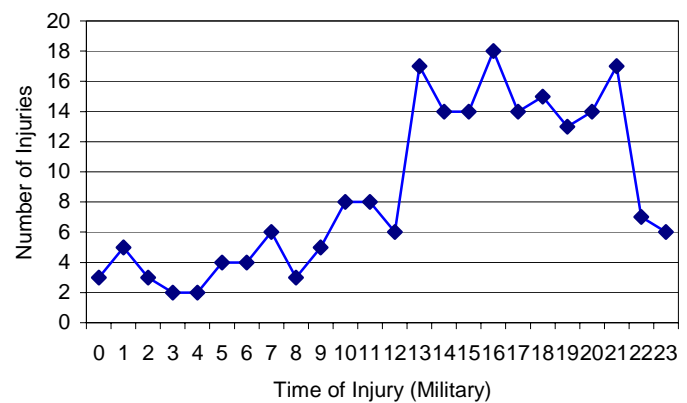
- A 79-year old male fell backwards down two steps while he was walking to the kitchen from the garage. He struck his head and was taken to a nearby hospital where he died six days later.
- A child, less than a year old, was crawling on a porch, fell down a step approximately one foot, and hit her head. She was taken to a nearby hospital and discharged one day later to her family.
- A 35-year old male tried to walk down a flight of stairs while intoxicated. He fell and lost consciousness. He was taken to a hospital and discharged 29 days later to home health care.
- An 82-year old female who lost her balance while walking down a flight of stairs fell backwards and hit her back and head on concrete stairs. She died three days later in a hospital.

Figure 1. Traumatic Brain Injuries Rates Resulting from Falls on Stairs/Steps by Age Group and Sex, Oklahoma, 1992-2003



*Annual average rates were calculated using 1998 Census data

Figure 2. Traumatic Brain Injuries Resulting from Falls on Stairs/Steps by Time of Day, Oklahoma, 1992-2003



- A 25-year old male, who had been drinking heavily, fell backwards and landed on a sidewalk while he was walking up the stairs to his apartment. He died at the scene.
- A woman found her 104-year old husband on the floor of their garage. He fell down a flight of three stairs and struck the back of his head. He died two days later at a local hospital.
- A 90-year old male fell out of the back door of his home onto concrete steps. His caregiver found him lying in a pool of blood. He was hospitalized for five days and was discharged to a nursing home.
- A 50-year old female who had history of confusion fell down nine steps. She suffered a cerebral contusion and was hospitalized for eight days before being discharged to her home.

DISCUSSION

Stairs/steps are risk factors for fall injuries. Injuries resulted from falling on or from stairs/steps in Oklahoma accounted for 4% of all falls resulting in a traumatic brain injury in the population from 1992 to 2003. Most of these injuries occurred at home. The age groups with the highest risks of injury were older adults and young children. Prevention of falls from stairs/steps will decrease injury morbidity and mortality, increase quality of life in these populations, and reduce the cost to society.

RECOMMENDED PREVENTIVE MEASURES

- Pediatricians should counsel parents on childhood injuries (including falls) and prevention during their visits.
- Parents of infants and toddlers should install gates at the top and bottom of stairs.
- Stairways should have protective devices such as handrails and non-slip, well-fixed stair carpets.
- Older adults should consider living in an environment without stairs whenever possible.
- Older adults with a tendency to fall should wear alarms that can be activated after falls for early emergency treatment of a fall.
- Adults should avoid excessive alcohol consumption as it may impair their judgment and balance as they walk up and down stairs.

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