

## **ABSTRACT**

The elderly population in the world as well as in Sri Lanka is growing faster. Falls are an important cause of morbidity and mortality among the elderly. A fall is defined as an event which results in a person coming to rest unintentionally on the ground or other lower level, not due to any extrinsic event (e.g. forcefully pushed down, knocked down by a car). Approximately 28-35% of people aged 65 and over fall each year. Falls are predictable and preventable, but if no precautions are taken, the elderly may get into a cycle of repeated falls. However, due priority was not given to prevention of falls either by the elderly or by the health care sector. Considering the paucity of available information on the elderly falls in Sri Lanka, this study was conducted with the objectives of assessing incidence, circumstances, risk factors and consequences of falls among the elderly population in the District of Colombo.

The study consisted of three components and was carried out during the months of August 2010 –March 2011. Component I was a community based descriptive study with prospective follow up. In a baseline visit, 1200 elderly aged 65 years or more, from 40 Grama Niladhari divisions in the district was enrolled in to the study and followed up for four months for assessing the incidence of falls. The investigators revisited the elderly who had falls during the follow up period in order to assess the circumstances of fall and injuries sustained due to falls. Component II was a nested case control study which assessed the risk factors for elderly falls. The elderly persons who had falls during the follow up period were considered as cases. Two controls per case were selected from the elderly who did not have any falls during the follow up period. Bivariate and multivariate analysis using logistic regression technique was used in identifying risk factors. In component III, the elderly who had falls in the initial two months following baseline data collection were followed up for further eight weeks in order to assess their disabilities following falls.

Out of 1200 elderly in the baseline population, 25.8% (310) had falls in the previous year, 43.7% (n=524) had limited their day to day activities due to fear of fall and 48.6% (n=583) perceived falls as a significant health problem.

Out of the 1185 elderly who were completely followed up, 12.8% (n=152) had falls during the four months follow up period. However, the total number of falls reported from them during that period was 194, because some participants had more than one fall. The incidence rate of falls was 492 per 1000 person years (95% CI= 448-536). Out of the elderly who had falls 14.5% (n=22) had more than one fall during the follow up period (recurrent falls). Incidence rates in 65 to 69 years, 70 to 74 years and above 75 years age groups were 360 (95% CI= 328-392), 458 (95% CI= 417-499) and 691 (95% CI= 629-753) person years respectively. Incidence rate of falls in females was 515 per 1000 person years (95% CI=469-561) where as it was 462 per 1000 person years (95% CI= 420-504) in males.

A majority of falls had occurred between 8 a.m. to 4 p.m. (52.2%, n=100), outside the house (52.6%, n=101) and at ground level (67.7%, n=130). A majority of inside falls had occurred in the living room (32.9%, n=30) and bed room (29.8%, n=27), while a majority of outside falls occurred in the garden (37.6%, n=38) and roads (25.7%, n= 26). Common extrinsic factors prevailing at the time of the fall included poor light (23.9%, n=46), slippery floor (20.8%, n=40) and uneven floor (16.7%, n=32). Fifteen percent (n=29) of falls were preceded by loss of consciousness (syncopal falls). The elderly could not get up without any help in the majority of falls (57.3%, n= 110). There were injuries or related acute medical problems in 65.6% (n=126) of falls and 71.4% (n=90) sought medical care. Outpatient care was received by 46.2% (n=42) and 34.4% (n=31) was hospitalized. The fall fatality rate was 252 per 10 000 elderly per year.

Injurious falls accounted for 48.5% (n=93) of falls and the majority of them were soft tissue injuries (73.5%, n=75) followed by fractures (23.5%, n=24). The common fractures reported after falls were fracture Tibia (33.3%, n=8), fracture hip (20.8%, n=5)

and fracture forearm (20.8%, n=5). The commonest anatomical sites involved in injuries were lower limb (44.1%, n=45), followed by head (20.1%, n=21). About one fourth of injuries (26.5%, n=27) were considered as major injuries and in one third of them (33.3%, n=9), the elderly stayed in hospital for more than seven days.

Risk factors for elderly falls identified in the multivariate analysis included falls in the previous year (OR= 4.665, 95% CI= 2.946 -7.387; p=0.000), high disability level (OR=2.043, 95% CI=1.1189-3.510; p=0.01) and high house risk level (OR=1.675, 95% CI=1.038-2.703; p=0.035). Attributable risk percents for falls in the previous year, high disability level and high house risk level were 78.6%, 51.1% and 40.3%, respectively.

The proportion of disabled elderly was highest within four weeks of fall (55.0%, n=44). Even though the proportion of disabled (51.3%, n=41) was reduced after eight weeks of fall, it did not reach to the pre fall proportion (40%, n= 32). The disability level was higher among the elderly in higher age group, female sex and lower educational level.

The high incidence of elderly falls, high injury rate and high disability level following falls reported in this study indicate the necessity of organized falls prevention and control programmes in both preventive and curative health sector. Community participation and multispectral collaboration are important in environmental risk modification for preventing falls.

**Key words: elderly, falls, incidence, injuries, risk factors, disability**