ORIGINAL ARTICLE
pISSN 0976 3325 | eISSN 2229 6816
Open Access Article
www.njcmindia.org

A CROSS SECTIONAL STUDY ON ASSESSMENT OF FALLS IN COMMUNITY DWELLING ELDERLY OF ASSAM

Rashmi Agarwalla[1], Anku Moni Saikia[2], Rambha Pathak[3], Farzana Islam[4], Madhur Borah[5], Mamta Parashar[4]

Financial Support: None declared
Conflict of interest: None declared
Copy right: The Journal retains the copyrights of this article.

How to cite this article:
Agarwalla R, Saikia AM, Pathak R, Islam F, Borah M, Parashar M. A Cross Sectional Study on Assessment of Falls in Community Dwelling Elderly of Assam. Ntl J Community Med 2016; 7(5):368-371.

Author's Affiliation:
[1]Demonstrator, Dept of Community Medicine, Hamdard Institute of Medical Sciences and Research, New Delhi; [2]Associate Professor, Dept of Community Medicine, Gauhati Medical College, Guwahati; [3]Professor, Dept of Community Medicine, Hamdard Institute of Medical Sciences and Research, New Delhi; [4]Asst Prof , Dept of Community Medicine, Hamdard Institute of Medical Sciences and Research, New Delhi; [5]Demonstrator, Dept of Community Medicine, Jorhat Medical College, Jorhat

Correspondence:
Dr Rashmi Agarwalla
Emai: rashmiagarwalla@gmail.com

Date of Submission: 12-01-16
Date of Acceptance: 03-04-16
Date of Publication: 31-05-16

ABSTRACT

Context: The five giants of geriatric that has been identified are immobility, instability (falls), incontinence, intellectual impairment and iatrogenic. Among these, falls are found to be a major problem in the elderly, causing injuries, dependence, psychological difficulties, and social isolation.

Aims: The present study was done to assess the prevalence of falls in elderly and the factors associated with it.

Settings and Design: This cross sectional study was done from August 2013 to December 2013 in Boko- Bongaon Block, Kamrup District, Assam.

Methodology: A total of 360 elderly meeting the inclusion criteria were included in the study. A total of 30 clusters were selected and 12 elderly were selected from each cluster.

Statistical analysis: Data was analyzed using SPSS version 20.

Results: Out of 360 elderly, 41.9% had at least one fall in the past one year. Among them, 14.7% had more than 2 falls in the past one year. On analyzing the association of various factors with falls as dependent variable, older age group, unsatisfactory housing condition, dependent IADL, depression, presence of a co morbid condition and malnutrition were found to have significant association.

Conclusion: The present findings reveal that falls is not an uncommon problem in the elderly.

Key words: Elderly, fall, Functional Status

INTRODUCTION

Elderly population is growing rapidly worldwide with similar trend being observed in India too. The elderly population is expected to rise from 8.1% in 2011 to 12% in 2026. [1]With this change in demographic trend, the challenge comes to address to the needs of elderly and add quality of life to the years lived. The World Health Organization proposes 'active ageing', which aims to extend healthy life expectancy and quality of life for all people as they age, including those who are frail, disabled, and in need of care.[2]Considering the magnitude of the ageing population and socio-economic changes in India, measures to keep older people healthy and active are of utmost importance.

Immobility, instability (falls), incontinence, intellectual impairment and iatrogenic problems have been identified as five giants of geriatrics. Among these, falls are found to be a major problem in the elderly, causing injuries, dependence, psychological difficulties, and social isolation.[3] Approximately 30% of community-dwelling people 65 years and

older have at least one fall each year.[4,5] Falls are the leading cause of injury among adults over the age of 65, and each year one in three older adults reports having had a fall, according to the Centres for Disease Control and Prevention.[6]

Unintentional injuries are the fifth leading cause of death in older adults (after cardiovascular disease, cancer, stroke and pulmonary disorders), and falls constitute two-thirds of these deaths. Elderly are more susceptible to falls and related injury because of a high prevalence of clinical diseases (e.g. osteoporosis) and age-related physiological changes (e.g. slowed protective reflexes) that make even a relatively mild fall particularly dangerous. In addition, recovery from fall injury is often delayed in older persons, which in turn increases risk of subsequent falls through reconditioning. [7]

Falls in elderly can occur due to many reasons. Internal and external environment can pose as a risk factor for falls in elderly. Various studies have shown that falls are dependent on many epidemiological and socio demographic factors.[8,9,10] But there are lack of studies and research to identify the areas of key concern and to plan policies to address the issues. The prevention of falls is of major importance because they engender considerable mortality, morbidity and suffering for older people and their families, and incur social costs due to hospital and nursing home admissions.[10] By identifying the risk factors and initiating plans of care to address these factors , falls can be prevented. The present study was done to assess the prevalence of falls in elderly and the factors associated with it.

SUBJECTS AND METHODS

The present cross sectional study was carried out in Boko-Bongaon block of Kamrup District, Assam, which is also a field practice area under the department of Community Medicine, Gauhati Medical College. The study was done from August 2013 to December 2013.The block consists of 140 villages as per Census 2011 report. Taking a prevalence of 51.5%[11]and error of 15% with design effect 2 the sample size was calculated to be 335. A two stage cluster sampling method was adopted for selecting the study population. A list of all the 140 villages in the block was procured and a cumulative population of elderly was calculated. From the list of villages, 30 villages were selected by cluster sampling method. In each identified village, all the elderly in age group of 60 years and above were enlisted and simple random sampling was used to select 12 elderly in each cluster for detailed survey.

Elderly above 60 years of age and those who gave consent were included in the study. Elderly who were seriously ill and who were visually impaired were excluded. House to house visit was conducted and all elderly meeting the inclusion criteria in each household were considered.

Falls was defined as any experience of falls in the past year (including any falls, such as falls when walking, slipped, falls due to did not sit/stand well, falls due to dizzy, whether caused injuries or not), and the times of falls in the past year. "Repeated falls" was defined as more than two falls. [12]

In the present study, functional dependency was measured by Katz Activities of Daily Living (ADL) scale[13] and Lawton's Instrumental Activities of Daily Living (IADL) scale[14]. On the basis of self-reporting, all elderly requiring help with one or more items or unable to perform any items as per Katz index were assigned to the functionally dependent group. IADL dependent have been defined as those elderly who were not able to perform one or greater that one IADL as per Lawton's IADL scale. Visual assessment was done by asking to count fingers at 1 meter distance; those who were not able to do so and were not using any visual aid were classified as being visually impaired.

The 5 point Geriatric Depression Scale (GDS) for screening depression and respondents having score ≥5 were considered to have depression.[15] Nutritional assessment of elderly was done by MNA (Mini Nutritional Assessment) scoring. [16]

Demographic variables included age, gender, and living arrangement (living with others or alone). The environmental condition was evaluated as appropriate and inappropriate. Houses having inadequate lighting, uneven or slippery muddy floors were considered as inappropriate. Elderly with known history of stroke, arthritis, gout, hypertension, thyroid abnormality, epilepsy with a medical prescription were categorized as having a co morbid condition.

Before commencing the field work, necessary approval for conducting the study by the Institutional Ethics Committee of Gauhati Medical College & Hospital was obtained. The respondents were carefully briefed prior to the commencement of field work regarding purpose of the study so as to get their full co-operation during the study period, so that information about the events under study could be obtained to optimal level.

Data was entered in Microsoft excel and was analyzed using SPSS version 20.

RESULTS

Out of 360 elderly, 57% were above 74 years of age and 55.4% of elderly interviewed were females. Only 10.3% of elderly were living alone and 89.7%

were living with their spouse or relatives. While assessing housing condition 66.7% were found to be living under unsatisfactory housing condition. Among the elderly, 24.3% were ADL dependent while 36% were IADL dependent. As per GDS evaluation 49.7% of elderly were found to be depressed. Use of more than 2 drugs was found in 42.3% of elderly. As per MNA scoring, 27% of elderly were found to be malnourished.

Table 1: Showing elderly with number of falls in the past one year

Number of falls	Number (%)
None	209 (58.1)
1-2 falls	98 (27.2)
>2 falls	53 (14.7)

Table 2: Binary logistic regression analysis of risk factors for falls

Factors	OR	95% CI	P value
Age(>74)	2.12	1.34-3.12	<0.001
Female gender	1.67	0.89-1.90	0.890
Living alone	0.76	0.53-1.84	0.703
Inadequate housing conditions	2.89	1.52-3.89	<0.001
Dependent ADL	0.65	0.32-1.12	0.721
Dependent IADL	1.78	1.27-2.34	0.0001
Depressed	2	1.08-3.41	<0.001
Co morbid condition	2.56	1.24-3.56	<0.001
Use of >2 medications	1.05	0.94-1.22	0.70
Malnutrition	2.36	1.67-2.90	<0.001
Visually impaired	1.15	1.03-1.68	<0.001

OR:ODDs Ratio; CI : confidence interval

Out of 360 elderly, 41.9% (151) had at least 1 fall in the past one year. Among them 14.7% (53) had repeated falls in the past one year. (Table 1) Among the 151 elderly who had falls, 44% (66) had falls indoors and rest 56% (88) of them had fallen outdoors. Out of the 41.9% (151) elderly with history of falls, fracture was reported in 18% (27) out of which 20% (5) were bed ridden due to the injury.

On analyzing the association of various factors with falls as dependent variable, significant association was found between older age group, unsatisfactory housing condition, dependent IADL, depression, presence of a co morbid condition and malnutrition. (Table 2)

DISCUSSION

As per the present study 41.9% of elderly had atleast 1 episode of fall in the past one year, while Prudham et al [9] found the prevalence of falls to be 28%.Various studies done in India have found prevalence of falls to range from 14% to 53%.[17,18,11,19] The high prevalence of fall reflects the need for proper interventions to prevent them, in order to prevent significant mortality and morbidity associated with it.

Older elderly were more at risk, similar to that found by Todd C et al.[10] Older elderly could be susceptible to falls due to decreased muscle strength and impaired mobility and require more effective care.

Elderly living in inadequate or unsatisfactory housing conditions were 2.89 times more at risk for falls that those living in satisfactory housing condition. Housing conditions of the elderly needs to be given due importance with proper lighting facility and non slippery flooring. Environmental (extrinsic) risk factors include physical environmental features in the home or community that may pose hazards, such as slippery or uneven surfaces, steps, and poor building design.[20]Extrinsic factors are more likely to be the cause of falls for the age-group of 60 to 74 years, whereas intrinsic factors are more likely to be the cause for those aged 75 years and older.[21]The interaction of biological factors with behavioral and environmental risks increases the risk of falling.

Elderly with Dependent IADL were 1.78 times more at risk of falls than those who are independent. The functional status of the elderly determines their ability to perform basic self care tasks and live independently. Kwann et al also found functional status of elderly to be significantly associated with falls.[22]Functional status of the elderly need to be evaluated well with proper interventions.

Present study found that nutritional status was found to have significant association with falls. Neyens et al also found that nutritional deficiencies suggesting malnutrition has been associated with increased risk .[23]Nutritional deficiencies in elderly needs to be focused upon to quality of life for them.

Having depressive symptom was found to have higher risk of falls, which was similar to findings of Biderman et al. It has been suggested that there were some common risk factors shared by falls and depression, and vice versa. [24]The prevalence of falling was associated with chronic/co morbid disease burden. Older adults commonly have more than one chronic disease, and the risk of fall increases with the number of chronic diseases.[25] As per Gillespie et al, home based exercise, home hazard management and modification for those with a history of falls, and multifactorial programs are all likely to be effective in preventing falls.[26]

The study had certain limitations, the numbers of falls were reported in the past one year and therefore there may be chances of recall bias in the number of falls. Also due to resource and time constraint dementia in elderly could not be assessed at the field level.

CONCLUSION AND RECOMMENDATIONS

The present findings reveal that falls is not an uncommon problem in the elderly. Further in depth studies are needed regarding the causes of falls and the role of prevention. Provisions for accessible geriatric health care services can help in improving functional competence, reduce falls and ultimately improve the quality of life in elderly.

Protection against falling may be maximized by interventions targeting multiple risk factors in individual patients. Health care providers should consider health screening of at-risk older people, followed by targeted interventions for deficit areas and providing comprehensive geriatric care. Geriatric clinics and OPDs as proposed under National Programme for Health Care of Elderly should be made functional from the primary care level and training of care givers and health workers with special focus on the elderly need to be considered. The WHO fall prevention model (WHO 2007) should be implicated at the community level with other components of fall prevention programs including education, medication review and modifications, identification and modification of environmental hazards, correction of refractive errors and prescription of appropriate assistive devices.With the elderly population increasing so rapidly, commitment and action is required at the policy making level for this particular age group.

Acknowledgement: We would like to acknowledge Mrs Anjana Moyee Saikia,Lecturer in Statistics,Dept of Community Medicine, Gauhati Medical College for her kind help in statistical analysis.

REFERENCES

1. Ministry of Statistics & Programme Implementation: Government of India. Situation Analysis Of The Elderly in India.New Delhi, India: Central Statistics Office;2011.p1-2.
2. World Health Organization. Active ageing: a policy framework. Available at: http://whqlibdoc.who.int /hq/2002/who_ nmh_02.8.pdf. Page 12.html. Accessed April 29th 2015.
3. Graafmans WC, Ooms ME, Hofstee HMA, Bezemer PD, Bouter LM, Lips P. Falls in the Elderly: A Prospective Study of Risk Factors and Risk Profiles. American Journal of Epidemiology.1996;143:1129-1136.
4. Ganz DA, Bao Y, Shekelle PG, Rubenstein LZ. Will my patient fall? JAMA. 2007;297:77–86.
5. Gill T, Taylor AW, Pengelly A. A population-based survey of factors relating to the prevalence of falls in older people. Gerontology. 2005;51:340–345.
6. Gomez A, Sloves G. Reducing Fall Risk. Aging Well. 2012;5:14.
7. Rubenstein ZL. Falls in older people: epidemiology, risk factors and strategies for prevention. Age and Ageing. 2006;35:37–41.
8. Campbell AJ, Borrie MJ, Spears GF. Risk factors for falls in a community-based prospective study of people 70 years and older. Journal of Gerontology. 1989;44:112-7.
9. Prudham D, Evans JG. Factors associated with falls in the elderly: a community study. Age Ageing. 1981;10:141-6.
10. Todd C, Skelton D. What are the main risk factors for falls among older people and what are the most effective interventions to prevent these falls? Copenhagen, WHO Regional Office for Europe.2004 (Health Evidence Network report.) Available on http://www.euro.who.int/ document/E82552.pdf.html. Accessed April 5th 2015.
11. Joshi K, Kumar R, Avasthi A. Morbidity profile and its relationship with disability and psychological distress among elderly people in Northern India. International Journal of Epidemiology. 2003;32:978–987.
12. Hsu HC, Jhan LJ. Risk Factors of Falling among the Elderly in Taiwan: A Longitudinal Study: Taiwan Geriatrics & Gerontolog. 2008;3:141-154.
13. Shelkey M. Katz Index of Independence in Activities of Daily Living(ADL) from the Hartford Institute for Geriatric Nursing, New York University, College of Nursing. Issue Number 2, Revised 2012.
14. Graf C. The Lawton Instrumental Activities of Daily Living (IADL)Scale, Hartford Institute for Geriatric Nursing, New York University, College of Nursing, Issue Number 23, Revised 2007.
15. Lenore Kurlowicz. The Geriatric Depression Scale (GDS), The Hartford University of geriatric Nursing Issue Number 4, May 1999.
16. Mini Nutritional Assessment. Nestle Nutrition Institute. Available from: http://www.mna-elderly.com/.html. Accessed September 26th 2013.
17. Dsouza SA, Shringapure A, Karol J. Circumstances and consequences of falls in Indian older adults. Indian J Occup Ther. 2008;4:3-11.
18. Johnson SJ. Frequency and nature of falls among older women in India. Asia Pac J Public Health. 2006;18:56-61.
19. Krishnaswamy B, Gnanasambandam U. Falls in older people. National/regional review, India. Available at: http://www.who.int/ageing/projects/SEARO.pdf.html. Accessed April 23rd 2015.
20. World Health Organization. WHO global report on falls prevention in older age. Available at: http:// www.who.int/ageing/ Publications/Falls_prevention7 March.pdf.html. Accessed April 29th 2015.
21. Lach HW, Reed AT, Arfken CL, Miller JP, Paige GD, Birge SJ, et al. Falls in the elderly: reliability of a classification system. J Am Geriatr Soc. 1991;39:197-202.
22. Kwan MM, Close JC, Wong AK, Lord SR. Falls incidence, risk factors, and consequences in Chinese older people: a systematic review. J Am Geriatr Soc. 2011;59(3):536–543.
23. Neyens J, Halfens R, Spreeuwenberg M, Meijers J, Luiking Y, Verlaan G, Schols J. Malnutrition is associated with an increased risk of falls and impaired activity in elderly patients in Dutch residential long-term care (LTC): A cross-sectional study. Archives of Gerontology and Geriatrics. 2013;56:265–269.
24. Biderman A, Cwikel J, Fried AV, Galinsky D: Depression and falls among community dwelling elderly people: a search for common risk factors. J Epidemiology Community Health. 2002;56:631-6.
25. Lawlor DA, Patel R, Ebrahim S. Association between falls in elderly women and chronic diseases and drug use: cross sectional study. BMJ. 2003;327:712-7.
26. Gillespie LD, Robertson MC, Gillespie WJ, Sherrington C, Gates S, Clemson LM, et al. Interventions for preventing falls in older people living in the community. Cochrane Database Syst Re. 2012;9:CD007146.