



PREVALENCE AND RISK FOR FALL AMONG ELDERLY IN URBAN AREA OF SOUTHERN KARNATAKA

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ABSTRACT

Introduction: Falls in older adults are a significant cause of morbidity and mortality. The cause is often multi-factorial, and may require a multi-disciplinary approach both to treat any injuries sustained and to prevent future falls. Objective was to estimate the prevalence of falls and risk factors for falls among elderly in an urban area.

Methods: 90 elderly patients aged >60yrs were included randomly from urban area and data was collected using a pretested questionnaire. Physical examination and functional assessment was done.

Results: In the study out of 90 elders, 42.2% of them reported falls in the previous year, of them 60.5% had one episode of fall and 39.5% them had recurrent fall. Most common reason for fall home was had uneven surfaces (60.5%). Abnormal Romberg's test was significantly associated with falls ($p = 0.008$). Mean ADL score was 19.66 ± 2.43 in elderly who had falls and 20.08 ± 2.09 in elderly who had no falls.

Conclusions: Falls are very common among elderly and various risk factors present at house and with other comorbidities in the elderly it becomes important to prevent the falls by making necessary modifications.

Key words: Falls, Elderly, Urban area, ADL score

INTRODUCTION

Ageing is a universal biological fact and a natural process. World Health Organization defines elderly as those above the age of 60yrs.¹ Population ageing is a triumph of humanity but also a challenge to society.² Worldwide, the number of persons over 60 years is growing faster than any other age group. The number of this age group was estimated to be 688 million in 2006, projected to grow to almost two billion by 2050. Moreover, the oldest segment of population aged 80 and over, particularly prone to falls and its consequences.³ India's aged population is the second largest in the world. As per Census 2011, the number of older persons was 103.2 million (8%).^{4,5}

Approximately 28-35% of people aged of 65 and over fall each year and 32-42% among 70 years of

age. The frequency of falls increases with age. Older people who are living in nursing homes fall more often than those who are living in community. Approximately 30-50% of people living in long-term care institutions fall each year and 40% of them experienced recurrent falls.⁶

Fall injuries are responsible for significant disability, loss of independence, reduced quality of life and mortality. The causes are often multi-factorial. Falls among elderly require a multi-disciplinary approach both to treat any injuries sustained and to prevent future falls.⁷

Hence this study was done with an objective to estimate the prevalence of fall, the risk factors for fall and to provide safety education to elderly.

MATERIALS AND METHODS

Community based Cross sectional study was conducted in urban area of Kolar Taluk for a period of 3 months. Elderly people (aged > 60yrs) residing in Urban areas were included, elderly who were moribund patients and had history of Mental illness were excluded from the study. Sample Size of 90 was estimates at 95% confidence level and 10% precision and 10% non response rate by using the proportion of falls as 30% in elderly population from the study by WHO.⁶

Systematic Random Sampling was done to collect the data. Baseline survey of the Byregowda Layout and Gandhi Nagar at Kolar was conducted. 1800 houses were surveyed for the baseline data and a total population of 9894 was found in these two urban areas. 1484 (14.9%) were elderly and were enumerated for the baseline data. K was estimated by Total elderly population / Total desired sample size = 16. A random number was picked from 1 to 16, 6th house was selected and data was collected by adding 16 to the subsequent nos. 6, 6 + 16, 22 + 16, and so on till the desired sample size of 90 was achieved. In the selected houses elderly population fulfilling the inclusion criteria were included.

Pretested and structured questionnaire was used to collect the data regarding Socio-demographic factor, history of fall and Risk assessment of fall. Informed consent was obtained before inclusion of subject in the study. Physical examination was done using the following measures-Height, Weight, BMI, Pulse rate, BP - sitting and supine. Functional assessment was done using ADL (Activities of Daily life), HMSE (for cognitive assessment), Visual Acquity, Whisper test, Get up Go test and Romberg's test.^{8,9,10,11,12,13}

Basic functional assessment: This included assessment of mobility, ability to use upper limb, visual acuity using Snellen's chart, Hearing ability by whisper test, presence of depression and urinary incontinence.

Activities of Daily Living - the Bethel ADL scale:⁸

Ten questions based on self-care tasks like bathing, dressing, eating, transferring from bed to chair, and back, voluntary control of bladder and bowel function, using the toilet, walking (not bedridden) and use of stairs were asked. At the end dependency for daily activities, completely or partially was assessed.

Cognitive Impairment using Hindi Mini Mental Status Examination (HMSE) scale:⁹

Questions on orientation to time and place, immediate recall, short-term verbal memory, calculation, language, and construct ability was assessed cognitive impairment. It is a 31-point scale, hence was

scored according accordingly to each question. A score of 20 or less was considered as cognitive impairment.

Data was compiled in Microsoft excel and SPSS 22 statistical software was used to analyze the data. Descriptive statistics like proportions and frequencies were computed. Chi-square test and t test was used as test of significance for qualitative data and Quantitative data respectively. p value of <0.05 will be considered as statistically significant.

RESULTS

Fall in Elderly was assessed on 90 subjects in various parts of urban area and was estimated that 42.2% had history of fall in the past one year.

Table 1: Demographical Profile of Elderly in the study

Demographic Variables	Fall in the Past 1 year		P value
	Yes (n=38) (%)	No (n=52) (%)	
Age			
< 65 Years	18 (47.4)	29 (55.8)	0.688
66 to 75 Years	12 (31.6)	15 (28.8)	
> 75 Years	8 (21.1)	8 (15.4)	
Gender			
Male	11 (28.9)	24 (46.2)	0.098
Female	27 (71.1)	28 (53.8)	
Education			
Illiterate	34 (89.5)	33 (63.5)	0.005*
Literate	4 (10.5)	19 (36.5)	
Occupation			
Retired	21 (55.3)	29 (55.8)	0.962
Working	17 (44.7)	23 (44.2)	
BPL			
Yes	27 (71.1)	17 (32.7)	<0.001*
No	11 (28.9)	35 (65.4)	
Spouse			
Alive	24 (63.2)	35 (67.3)	0.682
Dead	14 (36.8)	17 (32.7)	
Living with			
Spouse	5 (13.2)	5 (9.6)	0.866
Alone	13 (34.2)	19 (36.5)	
Others	20 (52.6)	28 (53.8)	
Type of Family			
Joint	21 (55.3)	30 (57.7)	0.818
Nuclear	17 (44.7)	22 (42.3)	
Financial Dependent			
Independent	18 (47.4)	23 (44.2)	0.768
Dependent	20 (52.6)	29 (55.8)	
Seek health care			
Govt Hospital	30 (78.9)	36 (69.2)	0.589
Private Hospital	7 (18.4)	14 (26.9)	
Others	1 (2.6)	2 (3.8)	

Further assessment was done to determine the sociodemographic, environmental, behavioral and medical risk factors for fall in elderly.

Table 2: Environmental Risk Factors associated with fall among elderly

Environmental Risk Factors	Fall in Past 1 yr		P value
	Yes (%)	No (%)	
n	38	52	
Cluttering	18 (47.4)	17 (32.7)	0.158
Hand holds	7 (18.4)	17 (32.7)	0.13
Threshold	25 (65.8)	43 (82.7)	0.065
Adequate lightening	21 (55.3)	39 (75)	0.05
Toilet location			
Within house	5 (13.2)	14 (26.9)	0.065
<10mts from house	16 (42.1)	26 (50)	
>10mts from house	17 (44.7)	12 (23.1)	
Type of Toilet			
Indian	34 (89.5)	49 (94.2)	0.405
Western	4 (10.5)	3 (5.8)	
Grab rail in toilet	1 (2.6)	7 (13.5)	0.075
Steps at the entrance of house	23 (60.5)	26 (50)	0.322
Floor of house-uneven/Slippery	12 (31.6)	9 (17.3)	0.114
Carpets/loose rugs on floor	9 (23.7)	9 (17.3)	0.455
Uneven surface in immediate surroundings of house	23 (60.5)	30 (57.7)	0.787

Table 3: Medical Risk Factors associated with fall among elderly

Medical Risk Factors	Fall in Past 1 yr		P value
	Yes (%)	No (%)	
n	38	52	
Diabetes Mellitus	4 (10.5)	6 (11.5)	0.88
Hypertension	8 (21.1)	13 (25)	0.662
Osteo Arthritis	31 (81.6)	36 (69.2)	0.185
Back Ache	28 (73.7)	19 (36.5)	<0.001*
Joint Instability	14 (36.8)	18 (34.6)	0.827
Foot Problems	20 (52.6)	14 (26.9)	0.013*
Get up Difficulty	21 (55.3)	23 (44.2)	0.301
Vision Problems	25 (65.8)	19 (36.5)	0.006*
Hearing Problem	20 (52.6)	22 (42.3)	0.332
Cardiac Problems	10 (26.3)	8 (15.4)	0.2
Weakness	22 (57.9)	21 (40.4)	0.1
Fits	0 (0)	1 (1.9)	0.39
Tingling sensation	15 (39.5)	13 (25)	0.143
Acute Illness in past 2 mnths	11 (28.9)	4 (7.7)	0.008*

Table 4: Behavioural Risk Factors associated with fall among elderly

Behavioural Risk Factors	Fall in Past 1 yr		P value
	Yes (%)	No (%)	
n	38	52	
Sleep Hrs			
2-4 hours	2 (5.3)	1 (1.9)	0.338
5-7 hours	11 (28.9)	22 (42.3)	
>8 hours	25 (65.8)	29 (55.8)	
Wear Slippers when Out	16 (42.1)	33 (63.5)	0.045*
Walk stick	13 (34.2)	7 (13.5)	0.019*
Alcohol consumption	24 (63.2)	33 (63.5)	0.976
Smoking	2 (5.3)	2 (3.8)	0.747
Exercise	16 (42.1)	18 (34.6)	0.469

Majority were in the age group 60 to 65 years, most of them were females, illiterates, belonging to BPL socio economic status, living in joint families, depending financially on other family members and

were seeking health care in government facilities. Association between various demographic factors among subjects with and with out fall showed that there was no significant association between two groups with respect to all the demographic characteristics of the subjects except for literacy status, were in higher percentage of illiterates had fall in the past year significantly (Table 1).

Various risk factors were listed and were assessed for their role in fall among elderly. It was observed that none of the environmental factors as listed in (Table 2), had a significant association for fall among elderly. Medical risk factor assessment showed that Low back ache, foot problems, vision problems and acute illness in past 2 months had a significant association for fall in elderly (Table 3).

Significant association was observed between behavioural risk factors such as wearing slippers when out, using a walk stick and fall in the elderly (Table 4). Abnormal Romberg's test was significantly associated with falls (p = 0.008), tremors was not significantly associated with falls. Activities of Daily life was assessed and a scoring system was developed for the same with a maximum of 21 score. ADL score was 19.66 ± 2.43 in elderly who had falls and 20.08 ± 2.09 in elderly who had no falls. It was observed that no significant difference was observed in score of ADL between elderly with and without fall (p = 0.258).

DISCUSSION

The overall prevalence of fall in elderly in the current study was found to be 42.2%. In a similar study, the prevalence was estimated to be 29.8%.¹⁴ In other study conducted in Chandigarh showed a prevalence of 51.5%.¹⁵ In India, the prevalence of falls in elderly was found to range from 14% to 53%, from a Multicentric study.¹⁶ This wide range can be attributed to high degree of under-reporting in Indian community and the prevalence vary in terms of sample size, geographical region, fall history criteria, and methods.

In the present study, frequency of fall was found to be high among women (71.1%) than men (28.9%), the proportions of fall were similar to the findings in other studies.^{17, 18} The reason could be increased life expectancy of women compared to men, as women tend to live more years than men, falls can be overrated and also as the number of women subjects were in majority this difference could have been observed. The rate at which the falls occur increases with age as observed in many similar studies, the reason being stiffer, less coordinated and more dangerous gaits among elderly.^{19, 20}

In this study, various risk factors were associated with fall among elderly. It was observed that none

of the environmental factors as listed in, had a significant association for fall among elderly. Whereas in study done by Patil SS et al. it was found that falls most often occurred while individuals were walking (on level or on uneven surfaces).²¹

Among the medical risk factor assessed, vision problems, low back ache, foot problems, and acute illness in past 2 months had a significant association with fall in elderly. Vision problem was also found to be a significant factor associated with falls among elderly in other Indian studies.^{14, 17, 22} The other medical factors like low backache and problems of the lower limbs were reported to be significant factors by WHO.²³

Among several behavioural risk factors assessed, not wearing slippers when going out, not using a walk stick were significantly associated with fall. Hence this study reemphasises that fall among elderly is a prevalent problem, with increasing dementia in elderly, the risk might increase three to four folds. The grave consequences due to fall can be reduced by minor environmental and behavioural modifications at individual and family level.

CONCLUSION

Falls are frequent in elderly. Illiteracy was significantly associated with fall. Musculoskeletal and visual problems are medical problems which had a significant role in causing falls. Inadequate lighting, uneven/slippery surface, not wearing slippers and using walking stick while moving out were the significant risk factors for fall among elderly.

RECOMMENDATIONS

From this study we recommend that awareness regarding fall has to provided and reemphasized by health care professional at every opportunity to limit the grave consequences of fall. Minor environmental and behavioral modifications such as avoiding the use of loose carpets, slippery surfaces, placing railings at appropriate places and favorable support by family members can prevent majority of fall among elderly.

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