Original article:

Study of the risk of falls in elderly with special reference to it's correlation with depression

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Abstract

Objective: To study the risk of falls in elderly with special reference to it's correlation with depression.

Methods: This is a hospital based cross-sectional study among 50 selected cases of elderly patients attending the Geriatric and Medicine OPD of Gauhati Medical College Hospital during May,2015 to August,2015. A detailed clinical history of the selected cases were recorded in standard Performa including literacy, financial status, co-morbidities, drug history and history of fall in the past followed by clinical data which included risk of fall assessment by Timed Get up & Go test , assessment of independence of activities of daily living by Katz index, assessment of depression by Geriatric depression scale and cognitive assessment by MMSE.

Results : Among 50 elderly subjects, 19(38%) of the subjects had an abnormal Get up and Go test result ≥20 seconds and 4(8%) had an abnormal result of >30seconds. 13(26%) of the subjects had depression according to Geriatric depression scale with a score of above 5 and depression was slightly more common in male than female subjects. A correlation coefficient(r) of +0.3635 with P-value0.0095 was found between GDS and Get up and Go test results while correlation coefficient of <0.25 with P-value>0.05 was found in linear regression analysis of GDS results with each of age ,sex, literacy and financial status.

Conclusion: This study shows that there is a significant positive correlation between prevalence of depression and risk of fall in elderly people of >60years age. The 10 meter Timed Get up and Go test and 15 point Geriatric Depression Scale can be effectively used to assess risk of fall and depression in these patients in order to undertake preventive measures. The prevalence of depression in these patients did not show any significant relation with age. sex. literacy and financial status but further studies with larger population is needed to study this association.

Introduction

Falls are a common problem particularly among the frail elderly population. There is a paucity of literature on the prevalence of falls among the older Indians. Although western literature shows that one in three older people living in the community fall every year and one in two hospitalized elderly fall annually, the prevalence is likely to be higher in India due to multiple factors which contribute to the risk.

The etiology of most falls is multifactorial. Apart from age related intrinsic physiological and environmental factors , many elderly persons acquire medical or neurological conditions which predispose them to falls. Various neuropsychiatric conditions like dementia , delirium, Pakinsonism, vertibro-basillar insufficiency and depression have been identified as factors which predispose an elderly to risk of fall. Cognitive decline can also be contributed by factors like depression which often

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blunts the corrective reflexes when an individual is prone to fall. The use of antidepressants, decreased cognition and poor balance are also associated with high risk of fall.

Studies on the elderly population in India. either in the community, inpatient, outpatient and old age homes have shown that depression is the commonest mental illness in elderly subjects, the rate being 522/1000 population in one study . Women had a higher rate of depression-704/1000 population. Another significant finding was the high rate of morbidity amongst the widowed persons. Older studies from Gero-psychiatric clinics reported a prevalence of depression ranging from 13 to 22.2%. Another study also reported depression to be the most common psychiatric diagnosis among the 1586 elderly subjects (age >60 years) who attended the Geriatric Clinic of the All India Institute of Medical Sciences. New Delhi. In a study of old age home population. major depressive disorder (13.4%) was the most common psychiatric diagnosis in this population.[1] As depression is a modifiable risk factor for falls, it is justifiable that treating depression specially by various non-pharmacological means in the elderly would help in reducing the risk of falls and its consequences.

This study has therefore been taken up to identify and assess the risk of falls in elderly using standardized tool like Timed Get Up and Go test and to find its correlation with depression by using the GDS scale. The results of such a study could therefore provide an opportunity to offer fall prevention strategies as part of ongoing treatment. Depression and falls are two common conditions that impair the health of older people. Both are relatively underdiagnosed and undertreated problems in primary care.[2] Depressive symptoms are a potentially modifiable risk factor for falls and

hence should be addressed in fall prevention programs especially in high risk population.

Materials and Methods

Sample population The sample population were the elderly patients attending the Geriatric and Medicine OPD of Gauhati Medical College Hospital during May,2015 to August,2015.

Sample size and inclusion criteria: The study was done in 50 randomly selected elderly patients aged >60 years who could walk independently with or without walking aid.

Exclusion criteria: Patients with history of CVA <6months duration , history of fracture <6months duration , Dyspnoea <NYHA Grade II , known depression or other psychiatric disorder or on drugs for such disorders, acute changes in mental status or acute emergencies, Katz index <5 and MMSE score <26 were excluded from the study.

Study design: This was a hospital based cross-sectional study. A detailed clinical history of the selected cases were recorded in standard Performa including literacy, financial status. co-morbidities, drug history and history of fall in the past followed by findings of clinical examination which included risk of fall assessment by Timed Get up &Go test , assessment of independence of activities of daily living by Katz index, assessment of depression by 15 point Geriatric depression scale and cognitive assessment by MMSE.

Statistical analysis: Statistical analysis was done using Microsoft excel 2007 and Graph Pad Version 3.10. Appropriate statistical parameters were analyzed to assess the risk of fall , prevalence of depression and the correlation of risk of falls with depression in the study subjects. The results were depicted in the form of numbers, ratios, percentages ,tables, charts etc. as appropriate.

Key points

Literacy: The definition of Literacy used in the study was as per Indian Census operations i.e the

ability to read and write with understanding in any language. A person who can merely read but cannot write is not classified as literate. Any formal education or minimum educational standard is not necessary to be considered literate.[12]

Financial status : Financially dependent or independent was defined as whether or not fully or partially dependent on others(family members or non-relations) for maintenance of day-to-day livelihood.[5]

Risk of fall assessment: This was done by **Get up & Go test –**

Started with the patient seated in a chair. Had the patient practice rising, walking 10 metres(30 feet), turning and returning to sit in the chair. Patient may use any assistive devices he/she normally uses(e.g. cane). After one practice session, time how long it takes the patient to rise, walk the distance and return to a seated position is recorded. Time less than 20 seconds suggest no problems(no risk of fall) and over 30 seconds suggest potential problems(Risk of fall)[6]

Activities of daily living: Assessment was done by Katz index of independence as follows-

Activities Points: 1 or 0	Independence: 1 Point	Dependence:0 point
Bathing Points:	1 Point: Bathes self completely or needs help in bathing only a single part of the body, such as the back genital area or disabled extremely	0 Point: Needs help with bathing more than one part of the body, getting in or out of the tub of shower. Requires total bathing
Dressing ponits:	1 point: Gets clothes from closets and drawers and puts on cloths and outer garments complete with fasteners. May have help tying shoes.	0 Points: Needs help with dressing self or needs to be completely dressed.
Toileting Points:	1 point: Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	0 points: Needs help transferring to the toilet, cleaning selfor uses bedpan or commode
Continence Points:	1 point: Exercise complete self control over urination and defecation.	0 point: Is partially or totally incontinent of bowel or bladder
Transferring Points:	1 point: moves in and out of bed or chair unassisted. Mechanical transferring aiders are acceptable	0 point: Needs help in moving from bed to chair or requires complete transfer.
Feeding Points:	1 point: Gets food from plate into mouth without help. Preparation of food may be done by another person	0 points: Needs partial help or total help with feeding or requires parental feeding.

GERIATIRIC DEPRESSION SCALE(GDS)[10] : The assessment for depression in the elderly study population was done by 15 point version of GDS as follows-

1. Are you basically satisfied with your life? YES/**NO**

2. Have you dropped many of your activities and interests? **YES**/NO

3. Do you feel that your life is empty? **YES**/NO

4. Do you often get bored? **YES/**NO

5. Are you in good spirit most of the time? YES/**NO**

6. Are you afraid that something bad is going to happen to you? **YES/**NO

7. Do you feel happy most of the time? YES/ **NO**

8. Do you often feel helpless? **YES/**NO

9. Do you prefer to stay at home rather than going out and doing new things? **YES/**NO

10.Do you feel you have more problems with memory than most? **YES/**NO 11.Do you think it is wonderful to be alive now? YES/**NO**

12.Do you feel full of energy? **YES/**NO

13.Do you feel pretty worthless the way you are now? YES/**NO**

14.Do you feel that your situation is hopeless? **YES/**NO

15.Do you think that most people are better off than you are? **YES/**NO

NOTE: Bolded answers scored. One point for each of these answers.

Cut-off : 0-5 -Normal

Above 5 -Suggest Depression

MINI MENTAL STATUS EXAMINATION: Cognitive assessment was done by MMSE as follows

Orientation	Points
Name:Season/date/day/month/year	5(1 for each name)
Name:Hospital/floor/town/state/country	5(1 for each name)
Registration	
Identify three objects by name and ask patients to repeat	3(1 for each object)
Attention and Calculation	
Serial 7s: Subtract from 100(e.g:93-86-79-72-65) subtraction)	5 (1 for each
Recall	
Recall the three objects presented earlier	3(1 for each object)
Language	
-Name pencil and watch	2(1 for each object)
-Repeat "No ifs, and or buts"	1
-Follow a three step command(eg:- take this paper, command)	3 (1 for each
Fold it in half, and place it on table)	
-Write "close your eyes" and ask patient to obey written command	1
Ask patient to write a sentence	1
Ask patient to copy a designieg: intersecting pentagons)	1
Total	

Results

A total of 50 elderly people who met the inclusion and exclusion criteria were included in the study.

Table 1 shows the baseline characteristics of the 50 study subjects of which 29(58%) were males and 21(42%) were females. The mean age of the subjects were 64.74±5.785 S.D (Range 60-85) and majority were in the 60-69 years age group(Median 63). 16(32%) of the subjects were illiterate and 40(80%) of the subjects were financially dependent on others.

Table 2 depicts the results of Get up and Go test which shows that 19(38%) of the subjects had an abnormal result ≥20 seconds and 4(8%) had an abnormal result of >30seconds with potential risk of fall.

Table 3 depicts the presence of depression in the study subjects which shows that 13(26%) of the subjects had depression according to Geriatric depression scale with a score of above 5 and depression was slightly more common in male than female subjects.

Table 4 shows that a significant positive correlation exists between GDS results with Get up and Go test results which means that subjects with greater GDS scores(i.e. with depression) had higher Get up and Go test results(i.e. Increased risk of fall).

Table 5 shows that age ,sex, literacy and financial status had no relation with GDS results and hence with depression in the study subjects.

Discussion

The results of earlier study suggest that the TUG (Timed Up and Go test) is a sensitive and specific measure for identifying community-dwelling adults who are at risk for falls. The TUG was found to be a sensitive (sensitivity=87%) and specific (specificity=87%) measure for identifying elderly individuals who are prone to falls.[7] Our study used the timed get up and go test to assess the risk of falls in the study subjects.

Study provides further evidence that the 15 point GDS is as accurate a screening test for depression in cognitively impaired as in intact patients.[9] The GDS-15 is a suitable instrument to diagnose depression in the general population of the oldest old. At a cut-off point of 3/4 the sensitivity and specificity of the GDS-15 were 88% and 76% respectively.[10] Our study also used the 15 point GDS as the screening test for depression in the study subjects with a cut-off point of 5.

Several studies[2,3,4] have shown association between depressive symptoms and recurrent falls in the elderly. The study [8] findings indicate that higher depressive symptoms predict falls over 12-months, independent of reduced executive and physical functioning. Multivariate models revealed that depressive symptomatology and antidepressant use were independent of each other, and independent of the presence of a high physiological fall risk and poorer executive functioning in the prediction of falls. Our study also found a significant positive correlation between depression and risk of falls in the elderly subjects in linear or univariate analysis with a strongly significant p-value of 0.0095.

Study has shown that prevalence of depression was significantly positively associated with increasing age , female gender. illiteracy, a low socio-economic status[11]. But, our study did not find any significant relation of age ,female gender, literacy and financial status with prevalence of depression. This was probably because of a smaller sample size in our study in comparison to other studies and hence similar study with a larger sample of elderly population is needed to establish this association

Conclusion

This study shows that there is a significant positive correlation between prevalence of depression and risk of fall in elderly people of ›60years age. The

10 meter Timed Get up and Go test and 15 point Geriatric Depression Scale can be effectively used to assess risk of fall and depression in these patients in order to undertake preventive measures. The prevalence of depression in these patients did not show any significant relation with age. gender, literacy and financial status but further studies with larger population is needed to study this association.

Tables and charts

Table 1. Baseline characteristics of the study population (n-50)

Characteristics		Males No. (%)	Females No.(%)	Total No.(%)	
Age group	60-69	22(55)	18(45)	40(80)	
(in years)	70-79	5(62.5)	3(37.5)	8(16)	
	≥80		2(100)	0(0)	2(4)
Literacy Illiterate		7(43.7)	9(56.3)	16(32)	
	Literate	22(64.7)		12(35.3)	34(68)
Financial	Dependent	20(50)	20(50)	40(80)	
status	Independent	9(90)		1(10)	10(20)

Table 2: Results of Get up and Go test in the study subjects (n=50)

		Males No. (%)	Females No.(%)	Total No.(%)	
Normal <20 seconds		18(58.1)	13(41.9)	31(62) Abnormal	20-30
seconds 9(60)		6(40)	15(30)		
	>30seconds	2(50)	2(50)	4(8)	

Table 3: Results of Geriatric depression scale in the study subjects(n=50)

	Males No. (%)	Females No. (%)	Total No. (%)
No depression	22(59.5)	15(40.5)	37(74)
Depression	7(53.8)	6(46.2)	13(26)

Table 4: Correlation of Get up and Go test results with Geriatric depression scale results by correlation and regression analysis

Geriatric depression scale

	Correlation coefficient(r)	P value	Interpretation
Get up and Go test	+0.3635	0.0095	Significant positive Correlation (P<0.05)

Table 5: Correlation of age, sex,literacy and financial status with Geriatric depression scale results

Geriatric depression scale

	Correlation coefficient(r)	P value	Interpretation
Age	0.0803	0.5793	Insignificant (P>0.05)
Sex	0.0447	0.7575	Insignificant (P>0.05)
Literacy	0.0199	0.8905	Insignificant (P>0.05)
Financial status	-0.0300	0.8358	Insignificant (P>0.05)

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