Original Article

Screening of Stroke Patients Using Performance Oriented Mobility Assessment (POMA) Scale

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Abstract

Background: The rapid growth of the elderly population has resulted in a corresponding rise in the number of elderly individuals who experience disability during their lifetimes.

Objective: The purpose of this study was to test the usefulness of four established clinical measures of balance, gait, and subjective perceptions of fear of falling as screening methods for referring community individuals living in residential care for detailed physical therapy evaluation and possible intervention.

Methods: 50 elderly individuals living in two residential care for the elderly were tested on clinical measures of balance and mobility. Their performance on these measures was compared with a physical therapist's brief evaluation of disability and appropriateness for more detailed evaluation. The usefulness of these tools as screening methods was determined by calculating validating levels using the physical therapist's evaluation as a standard.

Results: Thus, it can be analysed thatthe $p < 0.0001$ was kept as a highly significant reference value.

Conclusion: This study concludes that screening for balance and gait in elderly stroke patients with a combination of components which mainly measures the balance and gait using the performance oriented mobility assessment (POMA) scale gives the highest validity for the screening of stroke patients compared to the other scales.

Keywords: *Performance Oriented Mobility Assessment (POMA)*

Introduction

According to the World Health Organization (WHO) the Stroke is defined as "rapidly developing clinical signs of focal (or global) rapidly growing of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin[(2)].

The Performance Oriented Mobility Assessment (POMA) is also called "Tinetti– Scale".The Tinetti-scale was published by Mary Tinetti (Yale University) to assess the balance and gait in older adults and also to assess the perception of balance and gait during activities of daily living and fear of the falling. It also is a very good indicator of the fall risk of an individual[(3)].

But for the stroke patients, the level of functional independence is not only more reduced but it is more frequently disclosed then the risk of falls, since impairments such as muscle weakness, abnormal muscle tone, loss of sensory function, deficit of postural control and abnormal gait pattern appear to be due to the brain lesions[(3)].

The Performance Oriented Mobility Assessment (POMA) also examines the level of the balance and gait to determine the degree of the fall risk in the older adults.However, an assessment using both the

components of the Performance Oriented Mobility Assessment (balance and gait) may proven when assessing a specific impairment of an individual patient or predicting falls[3].

The Performance Oriented Mobility Assessment (POMA) balance component may be useful tool for predicting the occurrence of falls and examining the balance ability in the stroke patients. The balance component consists of 9 tasks scored in a ordinal scale including sit to and stand, standing with eyes closed,turning and pertubated balance[4].

The gait component examines the step length and height, gait initiation, step symmetry and continuity, straightness of the path of a travel while trying to walk in a straight line, trunk position and base of support during the period of double support[4].

Methods and Materials

Source of data:

1) B.J Medical College and Civil Hospital, Ahmedabad

2) VINS Hospital, Baroda

Research design:

Observational study

Sample design:

Simple random sampling

Sample size:

50

Selection criteria:

The elderly and geriatrics age groups (40 to 70 years)

Sex: Both

Muscle Power: More than 3 – Movement against gravity according to Manual Muscle Testing (MMT) of oxford scale

Exclusion criteria: Brain Tumor

Encephalopathy

Meningitis

Encephalitis

CNS Abscess

Procedure:

The test requires a hard armless chair, a stopwatch and 15 feet even and uniform walkway.

It has 2 sections:

a) To assess balance abilities in a chair and in standing;

b) To assess dynamic balance during gait on a 15 feet even walkway.

The patient has to sit in an armless chair and will be asked to rise up and stay standing.

The patient will then turn 360° and then sit back down.

This is to test the patient's balance.

Testing this, the evaluator will look at several key points including how does the patient rise from and sits down on his/her chair, whether or not the patient stays upright while sitting and standing, what happens when the patients' eyes are closed or when the patient gets a small push against the sternum.

Next, the patient has to walk a few meters at a normal speed, followed by turning and walking back at a "fast but safe" speed.

Then, the patient will sit back down.

As well as in the first part of the test, there are some pointsthat the evaluator has to look for.

These are:

a) The length and height of the steps,

b) The symmetry and continuity of the steps and

straightness of the trunk.

During this test, the patient can use any assistive devices (walking stick, crutches, walkers) they would normally use.

Thus we had taken the Performance oriented mobility assessment (POMA) scale to check the balance and gait component.

Data Analysis : Data was analysed with single t – test with MedCalc® Version 12.5.0.0 Windows XP/ Vista/7/8

Results

TABLE 1: COMPARISON OF COMPONENTS OF BALANCE AND GAIT SCORE IN STROKE PATIENTS

Components	Mean	SD	P-value
Balance	15.36	2.12	P < 0.0001
Gait	6.14	1.05	

TABLE 2: SCORE OF COMPONENTS OF BALANCE IN STROKE PATIENTS

BALANCE	Score 0		Score 1		Score 2		Total
	No.	%	No.	%	No.	%	
Sitting Balance	0	0.00	0	0.00	50	100.00	50
Arising	0	0.00	26	52.00	24	48.00	50
immediate standing balance	1	2.00	17	34.00	32	64.00	50
Side-by side standing balance	0	0.00	3	6.00	47	94.00	50
pull test	0	0.00	3	6.00	47	94.00	50
Turn 360	5	10.00	6	12.00	39	78.00	50
Able to stand on one leg for 5 Sec	27	54.00	14	28.00	9	18.00	50
Tandem stand	45	90.00	4	8.00	1	2.00	50
Reaching up	1	2.00	0	0.00	49	98.00	50
Bending over	33	66.00	17	34.00	0	0.00	50
sit down	7	14.00	4	8.00	39	78.00	50

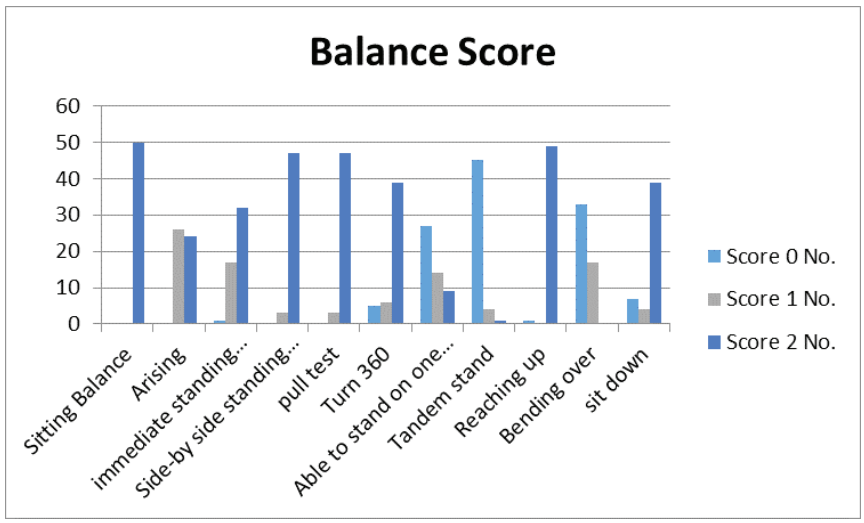
TABLE 3: SCORE OF COMPONENTS OF GAIT IN STROKE PATIENTS

GAIT	Score 0		Score 1		Score 2		Total
	No.	%	No.	%	No.	%	
Initiation of gait	41	82.00	9	18.00	0	0.00	50
Path	0	0.00	49	98.00	1	2.00	50
missed step	0	0.00	16	32.00	34	68.00	50
Turning	0	0.00	15	30.00	35	70.00	50
step over obstacle	9	18.00	4	8.00	37	74.00	50

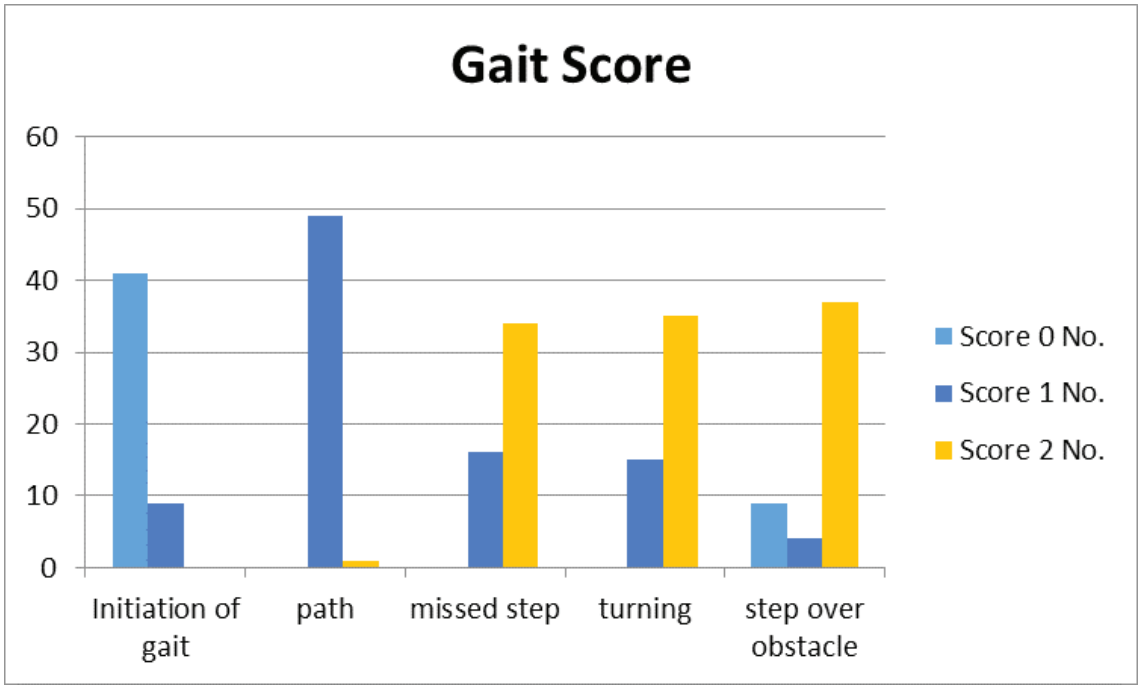
TABLE 4: SIGNIFICANCE OF P VALUE ALONG WITH MEAN AND STANDARD DEVIATION (SD) FOR BALANCE AND GAIT FOR SHOWING THE VALIDITY OF THE PERFORMANCE ORIENTED MOBILITY ASSESSMENT (POMA) SCALE WHICH INCLUDE BALANCE AND GAIT IN STROKE PATIENTS

	Mean	SD	P-value
Overall Score	21.50	2.65	$P < 0.0001$

GRAPH 1: DISTRIBUTION OF SCORE OF COMPONENTS OF BALANCE IN 50 STROKE PATIENTS



GRAPH 2: DISTRIBUTION OF SCORE OF COMPONENTS OF GAIT IN 50 STROKE PATIENTS



Discussion

According to data of Table 1, there is comparison of components of balance and gait score in the stroke patients. According to data of Table 2, there is presence of score of components of balance in stroke patients. According to data of Table 3, there is presence of score of components of gait in stroke patients.

According to data of Table 4, there is a significance of p value along with mean and standard deviation (SD) for balance and gait for showing the validity of the performance oriented mobility assessment (POMA) scale which include balance and gait in stroke patients.Thus the $p < 0.0001$ was kept as a highly significant reference value.

In general, stroke patients continue to adapt to their balance and gait deficits by avoiding the risk of falling or by using compensatory strategies; however their physical activity is further limited because of their fear of falling due to the psychological burden after a fall. For the stroke patient s, fall is a factor which reduces the quality of life so these patients should be treated with appropriately.

This present study was mainly conducted to study the validity of the performance oriented mobility assessment (POMA) scale in the patients of stroke. From our finding which indicates that the cut off value for the balance and gait component of the performance oriented mobility assessment (POMA), which could also predict the falls in the chronic stroke patients also. Mainly the performance of all the items is scored from 0, 1 or 2 for a maximum score of 28 with a higher score indicating better balance and gait. Thus, a total score of 19 or less indicates a high risk of falling and a score between 19 and 24 indicates a moderate risk. But the low scores of the performance oriented mobility assessment (POMA) scale have been shown to co – relate with the fall of the risk of the older adults.

In the previous study of the stroke patients , Z Gerontol Geriotar et al, showed that the performance oriented mobility assessment (POMA) scale has been recommended and widely used in the older adults to assess balance, gait and prediction of falls[5]. While S. Schulein (2014) demonstrated that performance oriented mobility assessment (POMA) scale can be used as a fast screening tool to evaluate the risk

of falling or changes in the balance or gait abilities and thus this study strengthened the validity of the performance oriented mobility assessment (POMA) scale in the patients of stroke[6].

Thus, from the results of this study, it can be taken as a note that by screening the stroke patients using performance-oriented mobility assessment (POMA) scale gives the highly significant level of the validity in the stroke patients.

Conclusion

This study concludes that screening for balance and gait in elderly stroke patients with a combination of components which mainly measures the balance and gait using the performance-oriented mobility assessment (POMA) scale gives the highest validity for the screening of stroke patients compared to the other scales.

Conflict of Interest: None

Source of Funding: All expenses of the study were funded personally by the researchers.

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