Original Research Article

Association between Confidence in Balance and Actual Balance Performance in Stroke Patients

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ABSTRACT

Introduction: Optimising balance confidence is the goal of rehabilitation among people with mobility problems including stroke. The aim of the study is to find out the association between confidence in balance and actual balance performance in stroke patients.
Methodology: 35 ambulatory patients of either gender irrespective of side and stage of stroke were selected. Berg Balance scale (for balance performance) and CONFbal scale (for measuring confidence in balance) were administered on subjects at the same time. The association between these two scales was found out using spearman's correlation test.
Result: Highly significant moderate level of negative correlation was found with P = 0.0087 and r= -0.437. Higher score of Berg Balance Scale (BBS) means better balance and lower score of CONFbal means better confidence. So, the result of this study shows that the balance performance and confidence in balance is correlated with each other. As the balance confidence increases, balance performance also increases and as confidence decreases, performance also decreases.
Conclusion: There is an association between balance performance and balance confidence in stroke patients. Balance confidence is a psychological variable affecting balance performance in stroke patients and so it should be considered in management of stroke patient to improve balance.

Key words: Stroke, Balance Confidence, Balance Performance

INTRODUCTION

Stroke is defined as a clinical syndrome characterized by rapidly developing clinical symptoms and/or signs of focal and at times global loss of cerebral function, with symptoms lasting more than 24 hours or leading to death, with no other apparent cause than that of vascular origin (WHO MONICA, 1988). [1] Ray-Yau (2005) also defined stroke as an acute onset of neurological dysfunction due to an abnormality in cerebral circulation with resultant hemiparesis. [2] One of the most pronounced and disabling effects of the neural injury is the impairment of balance regulation (Horak, 1991). [3] Following a stroke, balance is frequently disturbed and results in impairments in steadiness, gait, symmetry and dynamic stability (RayYau, 2005). Hemiplegic patients are treated with different techniques of neurophysiotherapy for their impairments. Cognitive

impairments will also affect balance in stroke patients. Till now, the motor and sensory impairments are treated to improve balance in stroke patients. Balance confidence is highly neglected variable in balance performance in all neurological conditions.

Despite the widespread use of the term balance, there is no universally accepted definition of human balance in the literature (Berg, 1989). [4] Balance is individual's ability to maintain posture. It is also defined as an ability of a person not to fall. [5] Balance is an integrated action of somatosensations, audio and visual receptors and muscular functions. Immediate action planning and decision making are also contributing factors of balance. Individual's anticipatory reactions and strategies should be in normal functioning state to maintain posture and thus balance. There are wide variety of outcome measures to measure balance performance e.g. Berg Balance Scale, Time get up and go test, one leg stance time measurement, Performance Oriented Mobility Assessment (POMA) etc.

Balance confidence is understood as people's conviction in the ability to engage in everyday functional tasks without losing their balance. [6] Confidence is a cognitive construct of an individual rather than emotional. Bandura defined the construct of self efficacy as 'Beliefs in one's capability to organise and execute the courses of action required producing given attainments'. [7] Falls self efficacy questionnaires consist of items reflecting emotional variables such as concerns, rather than cognitive variables such as beliefs, thus generating confusion about what is really being measured.[8,9] Activity specific balance confidence scale also known as ABC scale is widely used for stroke patients to measure their self efficacy for balance. CONFbal scale measures the confidence of individual in balance. CONFbal is used in elderly as well as in other neurological conditions where balance is affected. Very few articles have supported the role of confidence in balance performance. CONFbal validity and reliability is well checked on geriatric population. [6] Still on stroke patients, use of CONFbal is not well checked and proven. The primary aim of the study is to see the association between balance confidence and balance performance in stroke patients. The secondary aim would be to prove the use of CONFbal scale in measuring balance confidence in stroke patients.

It is hypothesised that there is an association between balance confidence and balance performance in stroke patients.

METHODOLOGY

This is a correlation observational study with total sample size of 35. The stroke patients reporting to neurophysiotherapy OPD of SBB College of Physiotherapy, V.S. Hospital were assessed properly and checked for inclusion criteria. The subjects fulfilling inclusion criteria were recruited for the study.

Inclusion criteria:
1. Patients with clinical diagnosis of stroke presenting with hemiparesis,
2. Patients who were able to communicate and comprehend verbal instructions,
3. Patients who were ambulant with or without walking aids.

Patients were excluded if they have any other cause for having imbalance like ataxia, vestibular dysfunction and postural hypotension. Patients with perceptual dysfunctions were also excluded. Subjects were explained regarding the study in brief. Berg Balance Scale was administered by therapist under structured environment to assess the balance performance. CONFbal was administered using the interview method then the response was noted. In order to prevent bias CONFbal was administered prior to actual testing of

balance but both were tested on the same day. CONFbal is a 10 item with three point ordinal scale which gives score between 10 to 30. Higher score of CONFbal means poorer confidence and lower score means better confidence. The total score of CONFbal was correlated with total BBS score using Spearmann's correlation coefficient.

RESULT
The present study was done on 35 hemiplegic patients with almost equal number of male and females. There were 17 males and 18 females. The demographic data is given in the below table.

Table 1: Demographic data of the subjects.

Total no. of subjects	35(17 males and 18 females)
Side of hemiplegia	21 left side hemiplegia
	14 right side hemiplegia
Age range	22 to 80 years
Mean age and SD(years)	52.25 ±15.83
Mean BBS score with SD	44.77±10.14
Mean CONFbal score with SD	17.11±5.09
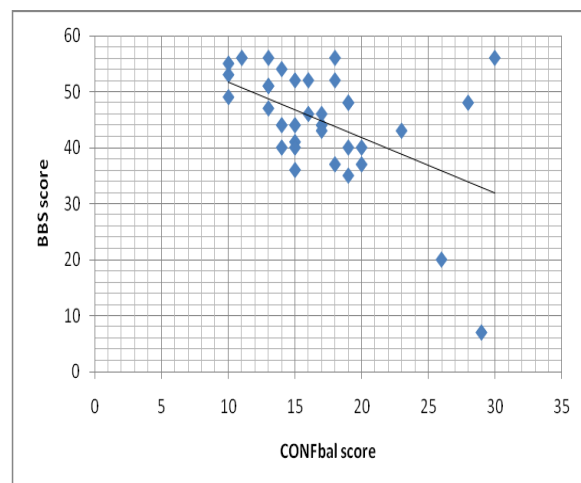
Graph 1: Negative correlation between the scores of CONFbal and BBS.

Data was analysed using Graph Pad Prism version 5.03. The CONFbal scale and BBS scale gives ordinal data. So, their correlation is done with nonparametric spearman's correlation test. The r value= (-0.4370) and p value= 0.0087. The test shows highly significant moderate level of negative correlation between the two scales. This means that as the score of one scale increases the other decreases. Higher score of BBS shows better balance whereas lower CONFbal score shows better confidence. So, the negative correlation between these two scales suggests that as balance confidence improves, the balance performance also improves in hemiplegia.

DISCUSSION
This study was done on 35 hemiplegic patients to see the association between their confidence level and balance performance. 60 % of them were having left side hemiplegia whereas 40%had right side hemiplegia. The male female distribution was almost equal. A large age range from 22 to 80 years show inclusion of all stroke patients irrespective of their age but 66% patients were of > 50 years of age. Age related neuro-degeneative changes might have contributed in impaired balance which might have affected the study result.

The mean BBS score 44.77 demonstrates low risk of fall in subjects of this study. Mean CONFbal score 17.11 shows that subjects had moderately affected confidence in balance. The main items affected in BBS were turning 360 degrees; step up step down, one leg stance. Whereas in CONFbal the main items affected were going up and down slope and ascending and descending stairs.

The correlation between CONFbal and BBS shows highly significant moderate level of negative correlation (r = (-0.4370) and p < 0.001).but as the lower score of CONFbal implies better confidence; hence it is proven that balance confidence and balance performance is correlated with each other.

The results of this study are supported by Olagun et al. They showed significant correlation between balance confidence and standing balance

performance of the stroke survivors with hemiparesis (p< 0.05). [2] Their finding suggested that high balance confidence results in good standing balance performance and low balance confidence implies poor standing balance performance. They have used ABC scale to measure balance confidence and Functional reach test to measure standing balance.

Hatch et al in 2003 have investigated the determinants of balance confidence in community dwelling elderly people and found that balance performance was strongly correlated to balance confidence in these community dwelling elderly people. [10] He had used BBS to measure balance, but there is scarcity of similar studies on stroke population. The present study is an effort to explain the role of balance confidence on balance performance on stroke patients.

It is often seen in the stroke patients that low balance performance patient demonstrates low confidence or high fear of fall and high balance performance will show high confidence level and low level of fear of fall. But, whether confidence affects performance or performance affects confidence is unclear. It has been observed that both of them affect each other up to certain extent.

Confidence is a psychological variable. It is difficult to measure level of confidence in stroke patients. ABC scale also known as self efficacy scale for balance is widely used in stroke patients but CONFbal is relatively easy to administer on stroke patients. CONFbal has only 10 item questions which can easily be applied on Indian population whereas ABC has some items asking for escalator use, walking in mall and walking on icy sidewalks which cannot be applicable to Indian population.

Contradictory findings in both variables e.g. poor actual balance with good balance confidence and good actual balance

with poor balance confidence were also found in few patients (n=12). Amongst them most (n=7) were male patients > 50 years of age.

This suggests that multiple factors can affect balance like muscle strength, family and care giver's support, emotional status of patients, personality type etc. So, they all should be taken in to consideration.

This study found no significant correlation between age and balance confidence and age and balance performance. This result is supported by Olagun et al. They have not found any significant correlation between balance confidence and age, height, weight, duration of morbidity and range of motion of the unaffected knee joint (p>0.05). [2] According to Gill body and Portney 2003,who had examined determinants of balance confidence among community dwelling elderly population, subjects characteristics examined were not contributing to balance confidence. [10] It is proven here that irrespective of the age, balance confidence varies in individuals with stroke patients. Few people with higher age can also show better confidence than younger stroke survivors. Once again this supports that balance confidence is a psychological variable.

Myers et al. (1996) found balance confidence to be significantly correlated with weight and negatively correlated with age. [11] But their study was done on normal geriatric population where as this study and study done by Olagun et al is done on stroke patients. So, this shows that stroke survivors balance confidence is not related with their age but rather on their will power, their care givers support and other environmental and cultural factors. The same explanation can be applied for no significant relation between age and balance performance. Olagun et al have found similar results and had argued that the insignificant correlations

in their study might be due to the effect of morbidity of stroke survivors with hemiparesis and the samples engaged in this study.

Similar kind of studies can be done with large sample size and different stage of stroke. Type of personality and gender of patient should be considered. Wide post stroke duration, ranging from 10 days to 10 years in studied population and wide age range limits the results to be generalised.

CONCLUSION

This study concludes that balance confidence and balance performance are associated with each other in stroke patients and so balance confidence has to be included as an important factor in assessing balance for stroke patients. Use of CONFbal in this study is proving effective role of CONFbal in measuring balance confidence in stroke survivors.

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