RELATIONSHIP BETWEEN TRUNK MOBILITY AND BALANCE IN PARKINSONS DISEASE.

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ABSTRACT

Background: As Falls are known to be frequent in patients with Parkinson’s Disease with a prevalence of approximately 13% and 70% annually. And also Trunk movement alteration in Parkinson’s patient may lead to motor impairment.

Objective: To find correlation between trunk mobility and balance in Parkinson’s patients. Methods and Materials: A study was carried out on 20 individuals of Parkinson’s Disease to assess trunk mobility and balance. 20 patients were selected according to too inclusive and exclusive criteria and were evaluated for assessing trunk mobility by Trunk Mobility Scale(TMS) and balance by Berg Balance Scale(BBS). Results: Our study shows trunk mobility compared to berg balance scale with (p<0.00001) which is very significant.

Conclusion: The study concludes that there is significant correlation of trunk mobility and balance in Parkinson’s patients.

Keywords: Parkinson’s Disease, Trunk mobility, Balance, Trunk mobility scale, Berg balance scale.

I. INTRODUCTION

Parkinson’s disease is progressive, degenerative disease of the CNS affecting mainly basal ganglia characterized by rigidity, tremor, bradykinesia and postural instability. Onset is insidious with slow rate of progression. Parkinson’s disease affects more than 2% of the population older than 50 years of age. The incidence and prevalence both increases with age. The outlook for patients with Parkinson’s disease is variable and is related to age at onset.1

Trunk movement alteration in Parkinson’s patient may lead to motor impairment. It is progressive and incurable with a variable prognosis. The axial rigidity seems to enhance the loss of functionality in patients with Parkinson’s, as it can cause difficulty in rolling over in bed and standing when in sitting position. As in Parkinson’s disease due rigidity, postural instability the body is unable to co-ordinate the movement and it becomes progressively more difficult to maintain proper posture and balance. Postural instability is a key component of functional mobility. In Parkinson’s disease balance problems and resulting falls are major factors determining quality of life, morbidity and mortality. As the disease progresses patients demonstrate abnormal and inflexible postural responses controlling their center of mass(COM) within their base of support(BOS). Frequent falls and fall injury are the result of progressive disease. Clinically, Posture instability further leads in loss of balance control. Faulty balance control may lead to fall related injuries abnormal gait patterns and reduced mobility. Falls are known to be frequent in patients with Parkinson’s Disease with a prevalence of approximately 13% and 70% annually. The risk increases exponentially with increasing age and disease severity. Although fall incidents are said to be increasing among older adults living in senior communities. PD patients fell more when compared with healthy adults of same age. The risk of fall is due to altered gait pattern and improper balance so it is important to assess gait and balance in Parkinson’s patients.
II. MATERIALS AND METHODS:
A correlational study was carried out on 20 individuals with Parkinsons disease taken from in and around Pune. Patients were selected according the inclusion and exclusion criteria.

Inclusion criteria includes patients diagnosed with Parkinson’s disease both males and females diagnosed since 1-2 years with age above 50 years those who were on their ON period. Patients were excluded on the following basis of criteria, the patients were not willing to participate, the patients who had recent fracture or injury to lower limb, Parkinson plus syndrome, cognitive impairment or any other major medical issues. Materials used during the study were consent form, Chair, table, Scales-berg balance scale Trunk mobility scale. The participants were assessed using trunk mobility and berg balance scale respectively.

III. MATERIALS:

Procedure:
Study was approved by institutional ethical committee of Tilak Maharashtra Vidyapeeth, Department of Physiotherapy. The consent form will be filled by the subjects and components of each scale was explained. On the basis of inclusion and exclusion criteria patients were selected.

Balance will be assessed with Berg Balance Scale. The subject is asked to maintain a given position for a specific time. Progressively more points are deducted if the time or distance requirements are not met. The components include Sitting to standing, Standing unsupported, Sitting unsupported, Standing to sitting, Transfers, Standing with eyes closed.

Standing with feet together, Reaching forward with outstretched arm, Retrieving object from floor, Turning to look behind, Turning 360 degrees, Placing alternate foot on stool, Standing with one foot in front, Standing on one foot. Demonstration of each task will be done and the scores will be recorded according to an individual performance.

Trunk mobility will be assessed by Trunk Mobility. The tests will be performed with the patient sitting on a chair, with no arm support, feet on the floor and the back kept 10 cm from the chair. Scores of dynamic items ranges from 0 to 3. The patient that performs movement with no compensation receives score 0. The patient that is unable to make the requested movement receives score 3. Scores 1 and 2 are attributed to individuals that perform the movements, but with compensations. The score is 1 for small compensations, and 2 for great compensations. Great compensations are exaggerated movements, easily noticed by an investigator (for instance, when inclining side-ways, the patient associate trunk rotation and/or flexion and/or extension movements). Small compensations are subtle movements, but that are present when the movement is performed. In the static aspect, the sitting posture analysis may range from 0 (upright sitting position) to 4.

Statistical analysis:
Data was collected and Microsoft office excel and Instat was used for statistical analysis.

Average values for various parameters were calculated and the level of significance was set at 5%.

<table>
<thead>
<tr>
<th>Risk of fall</th>
<th>No of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk falls</td>
<td>37%</td>
</tr>
<tr>
<td>Moderate risk falls</td>
<td>63%</td>
</tr>
</tbody>
</table>

Graph 1: Berg balance scale in Parkinson’s disease patients
Interpretation-The graph represents that out of total no of patients there were 50% of population having moderate risk of falls and 30% having low risk of fall.

Table no-2: Graphical representation of Trunk Mobility scale

<table>
<thead>
<tr>
<th>SCORES</th>
<th>NO OF PATIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>3</td>
</tr>
<tr>
<td>6-10</td>
<td>11</td>
</tr>
<tr>
<td>11-15</td>
<td>6</td>
</tr>
</tbody>
</table>

Graph 2: Trunk Mobility in Parkinson’s Disease patient

Interpretation-The trunk mobility impairment is seen in more 10 patients out of 20 patients.

Table no-3: Correlation between Trunk mobility scale and Berg balance scale.

<table>
<thead>
<tr>
<th>BERG BALANCE SCALE</th>
<th>TRUNK MOBILITY SCALE</th>
<th>R-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.7</td>
<td>7.85</td>
<td>0.8965</td>
</tr>
</tbody>
</table>

Graph 3: Correlation between Trunk Mobility and balance in Parkinson’s disease patients
The study concludes that reduced trunk mobility can lead to balance impairments in Parkinson’s disease patients. 

IV. DISCUSSION

The aim of the research was to assess the trunk mobility and balance in Parkinson patients as there is axial rigidity present which can be responsible for functional impairments of balance and motor control. 

Parkinson’s disease is the second most common degenerative disorder of nervous system characterized by large number of motor and non-motor symptoms having severe consequences on gait and balance. Facilitation is recommended in geriatric care to improve the social, psychological, intellectual, and cognitive performance of older people. Trunk control is known to be a crucial factor in the balance control, gait and functional independence. In several neurological disease abnormal posture and abnormal trunk control strongly impair motor abilities. As regards the trunk, forward flexion and lateral and anterolateral postures has been observed. As the trunk mobility scale shows a good correlation with berg balance scale so therefore any intervention that improves the trunk performance may facilitate improvement in balance. Active movement therapy focuses on axial impairment and gait deficits that are major contributors.

20 patients with Parkinson disease were assessed out of which 80% were male and 20% were female and mean duration of the disease 1.6 years, the mean berg balance score is 32.7, and the mean Trunk mobility scale score is 7.85.

Bloem et al. verified in the previous study that the best way to predict the occurrence of falls is to use a combination of factors, including the following: questioning about previous falls, severity of the disease and the Rhomberg’s test and the study revealed Parkinson’s disease fallers shows greater difficulty with rolling over in bed and have worse trunk mobility when assessed by trunk mobility scale.

Similarly, Steiger et al. also conducted a research on trunk movement alteration in Parkinson’s patients and according to the study the impairment of axial movement is the most common cause of disability in Parkinson’s disease patients. Trunk rotation contributes to many postural activities, such as rolling over, walking, turning during walking.

Balancing abilities is crucial to independence in daily activities, loss stability can lead to loss of functional independence, spreading disability and also a greater risk of falls. Patients with Parkinson’s disease who present with postural instability and gait disturbances tend to have more pronounced deterioration with a more rapid disease progression.

Out of all functional test examined, the berg balance score is more strongly correlated with a greater number of measures used, indicating its comprehensive relationship to balance, mobility, and walking speed in Parkinson’s disease patients.

V. CONCLUSION

The study concludes that reduced trunk mobility can lead to balance affection in Parkinson’s patients and there is significant positive positive correlation between trunk mobility and balance problem in Parkinson’s patients.

REFERENCES


