



## Effectiveness of Hatha Yoga on Balance assessed by Berg Balance Scale in Patients with Idiopathic Parkinson's disease

Dr. Shivani Bhat <sup>1</sup>, Dr. Radha Bhattad <sup>2</sup>

<sup>1</sup> BPT, Maharashtra University of Health Sciences, P.E.S Modern College of Physiotherapy, Pune, Maharashtra, India

<sup>2</sup> BPT, MPT (Neurosciences), Associate professor, P.E.S Modern College of Physiotherapy, Pune, Maharashtra, India

### Abstract

The purpose of this study was to find out the effect of the Hatha Yoga on balance in patients with Idiopathic Parkinson's Disease by the end of 8 weeks. 30 participants (including both males and females) ranging from 60-90 years old with Hoehn & Yahr stage 2 or 3 were randomly selected. Yoga sessions were conducted every alternate days for about 8 weeks. Each Yoga session comprised of 10 minutes of pranayama, 10 minutes of warm exercises, and 40 minutes of asanas followed by 10 minutes of supine relaxation in shavasana. The subjects were evaluated before and after the 8 week Yoga training program by using Berg Balance Scale scores. Statistical analysis of the data was done and significant improvement in the Berg Balance Scale Scores ( $p < 0.05$ ) was noted. Hence these results suggest that 8-week Hatha Yoga program significantly improves Balance in patients with Idiopathic Parkinson's disease.

**Keywords:** Hatha yoga, Balance, Idiopathic Parkinson's disease, Berg balance scale.

### Introduction

Parkinson's disease (PD) is a progressive disorder of extrapyramidal system affecting over 4 Million people over age 50 years with rates expected double over the next 2 decades <sup>[1]</sup>. It comprises of both motor and nonmotor symptoms. Primary cause of the disease is not known. Motor symptoms include:

**Rigidity:** Decreases the ability to move easily, reduced range of motion, postural instability. Bradykinesia: leads to increased time on task, freezing episodes and dependence in daily activities. Tremors: interferes with activities of daily living.

**Postural instability:** Weakness of antigravity muscles contributes to adoption of stoop posture, difficulty during dynamic destabilizing activities <sup>[2]</sup>

As the disease progresses there is an inflexible pattern of excessive postural tone and consequent reduced range of motion mechanically impedes the ability to execute postural reactions effectively making patients vulnerable to loss of balance and falls <sup>[3]</sup>. According to a retrospective fall study of 489 in-patients admitted to a department of neurology, approximately 60% of PD patients had a history of at least one fall over previous 12 months <sup>[4]</sup>. It has been also reported that 46% of ambulatory PD participants without Dementia experience a fall annually. Thus from the results of epidemiologic studies, it is evident that balance dysfunction and related falls are common in individuals with PD and the risk of fall increases gradually with disease progression without vigorous intervention to reduce the risk.

Yoga is an ancient art which involves controlled breathing,

Hatha yoga is a part of larger yoga framework which combines physical postures to address strength, flexibility, balance and mind body breath connection. The sequence of yoga asana is: slow rhythmic dynamic movement of body progressing to static state of holding and again returning to starting posture <sup>[5]</sup>.

Yoga improves muscle tone, strength, and flexibility. Thus helps to improve posture and trunk control which in turn may improve balance. Standing yoga poses target hip extensors, knee extensors and ankle plantar flexors which supports center of mass during walking and may improve overall stability. It is also improves functioning of respiratory, circulatory, digestive and hormonal system. The calming effect of yoga may lessen perceived stress, enhance relaxation and benefit sleep which may improve quality of life in Parkinson's disease <sup>[5]</sup>.

Yoga may be viewed as a gentle form of exercise that may be tolerated more easily by elderly or more functionally impaired participants with PD than other form of exercises. Also, a defined intervention protocol of increasing complexity of yoga postures would assist in standardizing the intervention rather than relying on the skills of the yoga instructor which could give varying results <sup>[6]</sup>. There are various literatures available which shows effect of yoga on balance, mobility and quality of life but this studies have had limitations considering the sample size which was less in number

### Methodology

#### (a) Purpose:

The purpose of this study was to find the effect of yoga on balance by the end of 8 weeks in patients with Idiopathic Parkinson's disease.

**(b) Selection of the subjects:**

30 patients with Idiopathic Parkinson’s patients (including both males and females) ranging from 60-90<sup>[7]</sup> with Hoehn & Yahr 2 or 3 were selected randomly from Parkinson society and nearby hospitals in Pune.

**(c) Procedure:**

Yoga session was given in “ON” period of medication, which is within 45min to 1 hour after medication.

1. Start with 10min of Pranayama.
2. Warm up: which will includes stretching and free range of motion exercises for trunk, arms, and legs for 10mins.
3. Proceed to the session of yoga asanas:

Starting with asanas in standing which includes Tadasana, Vrckshasana, Utkatasana, Urdhva hastasana. Progress to asanas in kneeling which includes Bitilasana, Marjaryasana. Proceed to asanas in supine which includes Setubandhasana, Salamba Bhujangasana followed by asanas in prone and sitting which includes Bhujangasana, Balasana and Vajrasana<sup>[8]</sup>

Patients were asked to hold each position for 15-30sec for first four weeks. Further progression was done by increasing the hold time to 30sec-1min.If the patient was unable to hold the position for a particular period of time, repetitions were given in order to complete the desired holding time and achieve the desired position. If the patient was not able to achieve the desired position, manual or mechanical assistance was given. Rest period of about 1-2min was given after each asana. Yoga session was given every alternate days for a period of 8 weeks. Berg balance scale was taken at the end of 8 weeks. The collected data was analyzed and interpreted by performing paired t test and conclusion was taken out.

**(d) Findings:**

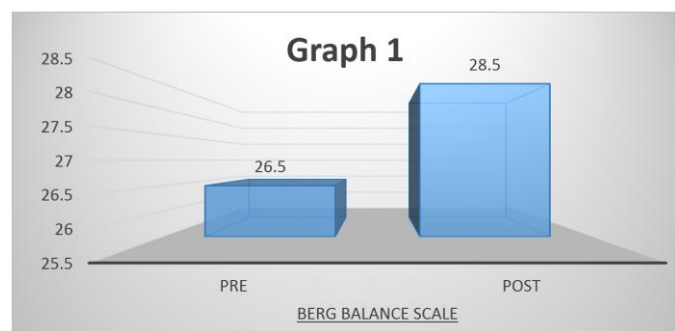
**Table 1:** Shows the number of males and females in the study

Males	Females
21	9

Pre and Post data was analyzed with the help of Graph Pad Instats®.

**Table 2:** Shows interpretation of balance using Berg Balance scale<sup>[9]</sup>

	Mean	t-value	p-value	Significance
BBS PRE	26.53±2.67	7.429	<0.0001	Extremely Significant
BBS POST	28.5±3.08			



**Graph 1:** BBS pre and post treatment data showing significant results.

**Results**

Post data analysis shows that that the p-value < 0.0001 which is extremely significant and hence yoga is effective in improving balance in patients with idiopathic Parkinson’s disease. (Table 2).

**Discussion**

The present study was done to check the effectiveness of yoga on balance assessed by Berg balance scale in patients with idiopathic Parkinson’s disease. In this study total 30 patients both males and females were included with mean age 70±10. We found that yoga is effective in improving balance in patients with idiopathic Parkinson’s disease.

In our study yoga is significantly effective in improving balance in PD. Our study included various yoga postures in standing and sitting which improves strength in core and lower limb musculature. Also the yoga postures in supine, prone and kneeling stretches the spine and thereby reducing the excessive postural tone and strengthens weak back extensors, hip extensors and hamstrings. Thus stretching of tight musculature and strengthening of the weak anti-gravity musculature reduces the postural instability thus improving static and dynamic balance. Also improvement in the balance helps to gain confidence and reduces fear of fall which improves overall mobility. Since exercise that challenges balance is known to decrease fall risk, these results demonstrate preliminary evidence that yoga shows potential as a fall prevention intervention. Our study is in account with Sabrina Youkhana<sup>[11]</sup>, conducted a study where Yoga based exercise program was given to the people aged 60 and over and its effects on balance and mobility were assessed. Her study included 307 participants. Two trials included Iyengar yoga, one included Hatha yoga<sup>[28]</sup>, one trial included both Iyengar and Hatha styles and two trials did not specify the style of yoga. Yoga was given for 60-90min, 1-2 times a week for 8-24 weeks. Study showed yoga has small but significant effect on balance and mobility. The limitation of this study was less frequency of sessions which is covered in our study whereas in our study the intervention period as well as the sample size is less.

Neena K Sharma<sup>[12]</sup>, who conducted a study to investigate effectiveness of yoga on physiological and health related Quality of life in individuals with Hoehn & Yahr stage 1-2 on 13 participants(control group=5, yoga=8).she conducted yoga sessions twice a week for around 12 weeks. Her results suggested a significant improvement in UPDRS, diastolic BP & average forced vital capacity. This suggests that yoga may improve aspects of QOL & physiological functions.

In contrast to our study, Emma Hall<sup>[13]</sup> who conducted a pilot study (single subject design) on a 69 year old female with Hoehn & Yahr stage 2, to find out the effectiveness of yoga on balance, mobility, and quality of life. She conducted weekly sessions for about 60 minutes, for 8 weeks and concluded that there was improvement Berg Balance Scale and Timed Up and Go, but these changes were not clinically significant whereas no change in Quality of Life was noted. Her study justified the need of larger sample size and increased frequency of sessions along with an advanced protocol which is covered in our study whereas she also studied the effect on mobility and quality of life which is not included in our study.

## Conclusion

In this study yoga shows significant effects on balance as assessed by Berg Balance Scale in patients with Idiopathic Parkinson's Disease.

## References

1. Dorsey ER, Constantinescu R, Thompson JP, Biglan KM, Holloway RG, Kieburtz K *et al.* Projected number of people with Parkinson disease in the most populous nations, 2005 through 2030. *Neurology*. 2007; 68(5):384-6
2. Susan BO'Sullivan, Thomas J Schimtz, George D Fulk. *Physical Rehabilitation*, 6<sup>th</sup> edition
3. Jeong-Ho park, yeo-Jeong kang, fay bahling horak, what is wrong with balance in parkinson's disease. *Journal of movement disorders*.
4. Stolze H, Klebe S, Zechlin C, Baecker C, Friege L, Deuschl G. Falls in frequent neurological diseases--prevalence, risk factors and aetiology. *J Neurol*. 2004; 251:79-84. [PubMed]
5. Kaitlayn R Roland *Yoga for parkinson's The Michael. J fox foundation (for Parkinson's Reasearch)*, 2015.
6. Colgrove YS, Sharma N, Kluding P, Potter D, Imming K, Vande Hoef J. Effect of yoga on motor function in people with Parkinson's disease: a randomized, controlled pilot study. *J Yoga Phys Ther*. 2012; 2(2):112.
7. Ni M, Mooney K, Signorile JF. Controlled pilot study of the effects of power yoga in parkinson's disease. *Complementary therapies in Medicine*, 2016, 25.
8. Swati Bhagat PT, *Alternative therapies*. 1<sup>st</sup> edition.
9. Swati Bhagat PT, *Alternative therapies*. 1<sup>st</sup> edition.
10. Qutubuddin AA, Pegg PO, Cifu DX, Brown R, McNamee S, Carne W. Validating the Berg Balance Scale for patients with Parkinson's disease: a key to rehabilitation evaluation. *Archives of physical medicine and rehabilitation*. 2005; 86(4):789-92.
11. Youkhana S, Dean CM, Wolff M, Sherrington C, Tiedemann A. Yoga-based exercise improves balance and mobility in people aged 60 and over: a systematic review and meta-analysis. *Age and ageing*. 2015-25; 45(1):21-9.
12. Neena K Sharma, Kristin Robbins, Kathleen Wagner, Yvone M Colgrove. A randomized controlled pilot study of the therapeutic effects of yoga in people with parkinson's disease, 2015, 8.
13. Emma Hall, Geert Verheyden and Ann ashburn. Effect of yoga programme on an individual with parkinson's disease: a single subject design, 2011, 33.