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Research Article

Effect Of Yoga Therapy On Fatigue, Sleep Quality And Balance In Patient With Post Covid Hemiplegic Stroke: A Case Report.

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ABSTRACT

Introduction: Stroke is a majorly considered severe health condition treated by physiotherapists. Post-stroke condition leads to remote future involving the impairment to the motor and sensory deficits which eventually affect the activities of daily activities due to balance impairment. The recent studies have proven that yoga is effective for people with physical and psychological impairments/conditions. Evidences for post stroke balance training rehabilitation is currently derived from: studies with balance as a secondary outcome, various case studies; studies included assistive devices but no specifications regarding the balance training.

Method: This is a case study of a patient aged 45 years male; who presented with symptoms like difficulty in performing movements with the left upper and lower extremities. His main concern was breathlessness and maintaining balance during dynamic activities. In this case study, throughout the intervention, the patient's progress was monitored using the Fatigue Severity Scale (FSS), Pittsburgh Sleep Quality Index (PSQI) and the Berg Balance Scale (BBS). Interventions included various yoga asana that tend to improve balance and sleep quality and reduce fatigue in the patient. This case emphasizes the importance of a comprehensive and integrated physiotherapeutic approach along with yoga in addressing patients with post covid hemoplegic stroke.

Results: The results showed benefit in overall functional development of the patient. The improvement was seen on Fatigue Severity Scale, Pittsburgh Sleep Quality Index and Berg Balance Scale.

Conclusion: According to this case study, implementation of Yoga therapy in adjunct with Conventional physical therapy showed remarkable & noteworthy results in fatigue, sleep quality and balance outcomes post intervention in Post Covid Hemiplegic Stroke patient.

Keywords: Post-Covid Hemiplegic stroke, Pittsburgh Sleep Quality Index, Chronic Kidney Disease

INTRODUCTION:

Stroke is a majorly considered severe health condition treated by physiotherapists[1, 2 ,3]. Post-stroke condition leads to remote future involving the impairment to the motor and sensory deficits which eventually affect the

activities of daily activities due to balance impairment[1,2] studies reveal that balance impairment is associated in post stroke falls unto 73% of total stroke survivors[2,4] Rehabilitation focuses on recovery of function, improving balance and quality of life to maximum achievable level; and may include various complementary yoga strategies[1] Impairment in balance leading to falls provide a negative effect the self-balance fear of fall which eventually reduce the health status and quality of life [2,5-8]

The recent studies have proven that yoga is effective for people with physical and psychological impairments/conditions. Whereas recent study from non-Cochrane systemic review came up with a conclusion that yoga can be used as a crucial part in stroke rehabilitation. Aim of the protocol was to assess the repercussions by adding yoga in the stroke rehabilitation to improve the balance, fatigue and quality of life post- stroke.

Evidences for post stroke balance training rehabilitation is currently derived from: studies with balance as a secondary outcome, various case studies; studies included assistive devices but no specifications regarding the balance training. Likewise, there are studies for the early (1-3months) but not for the chronic post stroke period [4,9,10] Studies performed on various conditions such as multiple sclerosis, Parkinson: but there is a limited study for yoga with fatigue, balance and quality of life for post covid stroke.

There are no studies or investigations suggesting the effects of yoga on subjects who have had a stroke or hemiparesis. Various yoga postures can be taught to people with neurological conditions such as multiple sclerosis and stroke said Bell and Seyfer [16].

There are 3 case studies involving yoga for stroke recovery; and giving a spotlight on improving balance and quality of life. While some studies reveal that yoga is beneficial in improving strength, range of motion during walking and performing other daily activities [4, 11] Studies have majorly concluded that yoga can be used for the well-being in engaging physical and cognition in post stroke patients. Yoga will be more beneficial in improving the functions by encouraging co-ordination with the complex movements, balancing, strengthening and breathing.

PRESENTATION OF CASE:

This is a case study of a patient aged 45 years male; who presented with symptoms like difficulty in performing movements with the left upper and lower extremities. His main concern was breathlessness and maintaining balance during dynamic activities. Patient was diagnosed as Post Covid Hemiplegic Stroke

There was no significant family history for the similar incidence. Patient had medical history of chronic kidney disease (CKD) for 8 years and hypertension for 9 years; he was on regular medications. He was tested positive for Covid-19 test 6 months ago.

Patient was an occasional alcoholic drinker and regular tobacco smoker (5-6 packs/day) for 10 years. He tried ceasing after the diagnosis of CKD for 6 months but again resumed and continued until these (stroke) symptoms occurred i.e., 1 year ago.He underwent following investigations;

Sr. No.	Investigations	Results	Normal values	Date of assesment
1.	Hematology report	11.3gm/dL	Men: 13-18gm/dL	12.11.2020
2.	Creatinine, Serum	3.04mg/dL	0.90-1.30mg/dL	
3.	USG abdomen pelvis	B/L marginally raised renal cortical echogenicity.		10.11.2020
4.	Renal function test A. Blood urea B. Serum creatinine	91 mg/dL 3.7 mg/dL	15-40 mg/dL 0.5-1.5mg/dL	24.12.2020

Table no. 1: List of investigations and their scores

Clinical Findings:

It was observed that the subject had flexor synergy in the upper extremity and extensor synergy in the lower extremity. On postural evaluation, it was observed that the right shoulder was depressed as compared to left, forward head posture and rounded shoulders laterally along with functional scoliosis posteriorly. Left side ASIS was prominent due to pelvic tilting on right side and hip hiking. Due to hip hiking, pelvic tilting and weakness in lower limb subject had adapted circumductory gait where initial stance-swing were absent.

Motor evaluation presented that upper extremity of the left side was hypertonic (grade 1+) i.e., spasticity in biceps. Voluntary control grading (VCG) right upper limb was grade 4 (hand to sacrum), lower extremity- grade 3 (flexor/extensor synergy developed) and hand- grade 5 (palmar prehension). Active range of motion in upper and lower limb were incomplete but pain-free. On the sensory examination, 2-point discrimination of the left upper extremity and lower extremity was impaired (grade1). Deep tendon reflex examination of left triceps and biceps was grade 3 (exaggerated) supinator and knee- grade 1(diminished), ankle- grade 0(absent).

Hand assessment included wrist flexors and extensors that scored fair grade, precision was good and prehension was fair.

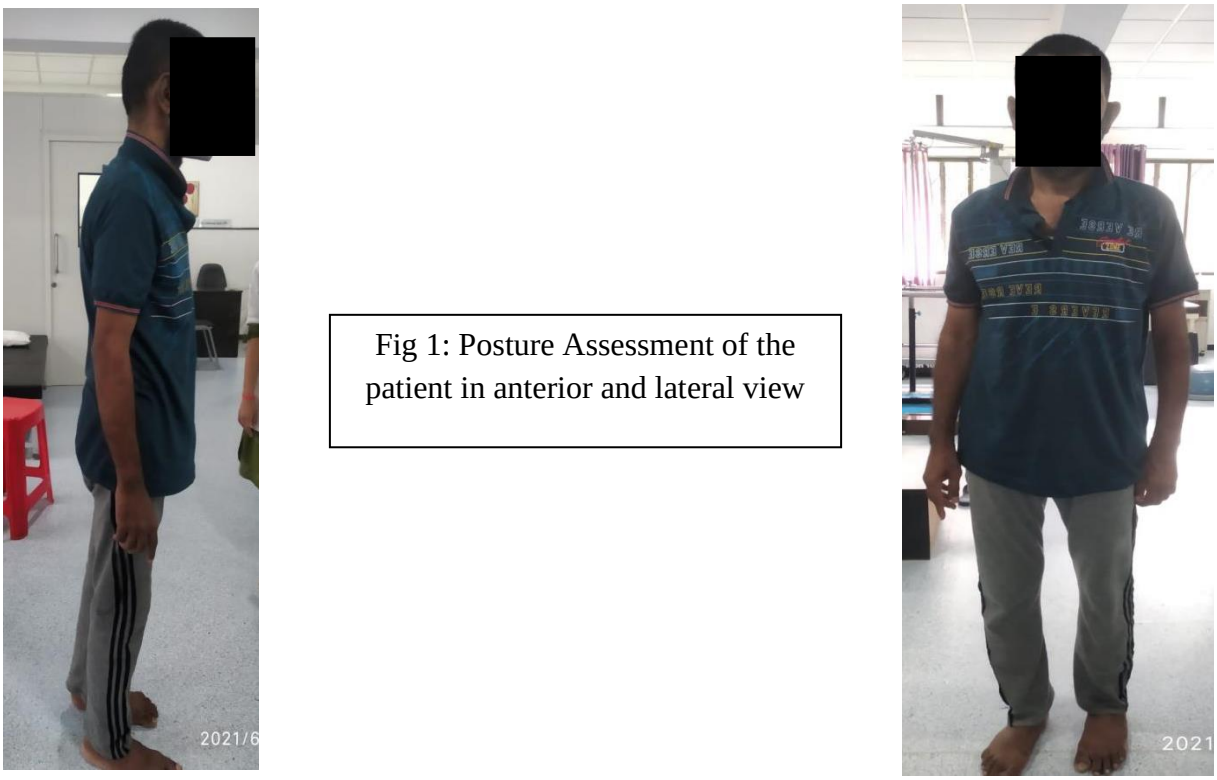


Fig 1: Posture Assessment of the patient in anterior and lateral view

OUTCOME MEASURES:

I. Fatigue Severity Scale (FSS)
II. Pittsburgh Sleep Quality Index (PSQI)
III. Berg Balance Scale (BBS)

PHYSIOTHERAPEUTIC INTERVENTIONS:

Sr. No.	Name of the exercise	Instructions	Rationale
1.	***Tadasana*** (Hold for 10 counts) May increase gradually	Stand erect on your toes, hands straight up & stretch yourself towards the sky.	✓ Promotes good posture ✓ Improves flexibility ✓ Reduces fatigue ✓ Boosts self-esteem.
2.	***Sukhasna*** (hold until possible)	Sit in regular cross sitting position.	✓ Helps to remove stress ✓ Improves digestive health ✓ Increases the focus of mind & concentration
3.	***Cat / cow pose (Marjaryasana / bitilasana)*** (10 repetitions of each with 3 sets)	Quadruped position, take a deep inhale & lift your lower back; maintain firm abdominals, exhale & lower your chest towards the floor (look up slightly)	✓ Relax & ease stress ✓ Breath synchronized pose is beneficial for body & mind ✓ Improves focus, concentration & mental stability ✓ Calms you down.
4.	***Deep Breating*** (11 rounds from both side) May increase gradually	Sit in any comfortable position, inhale deeply through nose & exhale through nose. (inhale: exhale = 1:2)	✓ Reduces fatigue ✓ Natural painkiller ✓ Improves blood flow ✓ Calms down anxiety
5.	***Child Pose / Balasana*** (May hold the pose as long as possible)	Sit on your both legs (vajrasana), bend forward while exhaling. Place forehead on the floor. Relax shoulders. Rest arm alongside, facing palms upwards.	✓ Promotes soothing effect to the brain ✓ Relieves stress, depression, anxiety & insomnia ✓ Foster blood circulation ✓ Reduces the fatigue ✓ Enhances slow and deep breathing
6.	***Legs—up-the wall /Chair pose*** (May hold the pose as per comfort level)	Lie down on the floor, inhale & raise your legs and place them on wall / chair	✓ Great stretch to inner thigh & groin ✓ Improves blood circulation in lower body that is stalled due to long sitting
7.	***Butterfly pose*** (10-12 flaps with 3 sets) May increase	Normal sitting with feet touching each other, shoulder relaxed. Back straight. Hands placed on the feet.	✓ Helps relieve mild depression, anxiety and fatigue

	gradually as per the progression	Flap thigh up & down	
8.	***Supta baddha konasana*** (May hold the pose till comfort level)	Place pillow behind & lie down on it until the upper back portion. Place another pillow below the laps, cross legs & lie down on it	✓ Works on the back of the legs ✓ Improves blood flow to the brain ✓ Strengthens the anus ✓ Improves the body posture.
9.	***Adhomukha swastikasna***	Sit with legs crossed: if knees lift up higher, use blanket for support, Pull a blanket/ pillow on laps & lean forward, resting your forehead on it. (if blanket or pillows are not comfortable use chair)	✓ Increases stamina ✓ Relieves ✓ fatigue ✓ Promote deep breathing ✓ Increases focus and concentration
10.	***Warrior 2 pose***	Spread your legs wide apart; twist your ankle in 90° towards right side, hands straight in shoulder level & parallel to the ground. Hold the position. (repeat the same from opposite side)	✓ Better oxygenation ✓ Increases lung capacity ✓ Reduces strain on circulatory system
11.	***Kumbliak***	Inhale deep. Hold breath for 10 counts & slowly exhale through nose (counts can be increased once you achieve the number)	✓ Reduces stress ✓ Minimizes snoring Maintains healthy heart ✓ Beneficial for high ✓ BP and low BP
12.	***Anulom Vilom***	Inhale through one nostril keeping the other one close, breath hold for 5 counts & exhaling through the opposite. Repeat the same with opposite nostril.	✓ Infuses body with oxygen Reduces stress & anxiety ✓ Balances your right & left brain ✓ Helps in meditation
13.	***Naadi shodlian Pranayama***	Inhale and exhale through single nostril, the other should be closedwith the help of thumb. Repeat the same from other side	✓ Enhances breathing pattern ✓ Improves lung capacity ✓ Reduces fatigue, anxiety ✓ Keeps mind calm

Table no 2: Yoga Exercise Protocol for Flexibility, Balance and Fatigue in Stroke Patients

Fig 2: Wide BOS with e/o and e/c

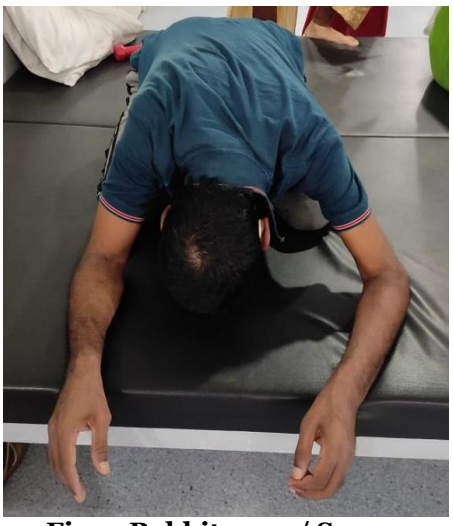


Fig 3: Rabbit pose / Sasangasana

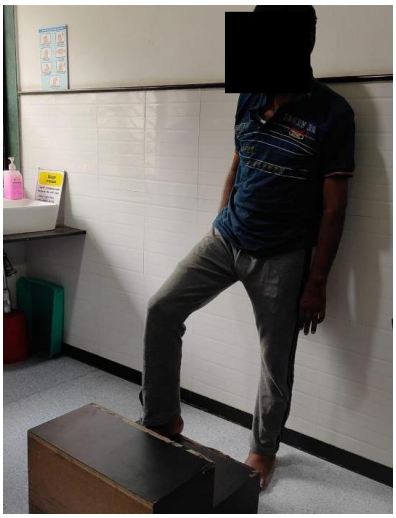


Fig 4: Modified Vrikshasana

RESULTS:

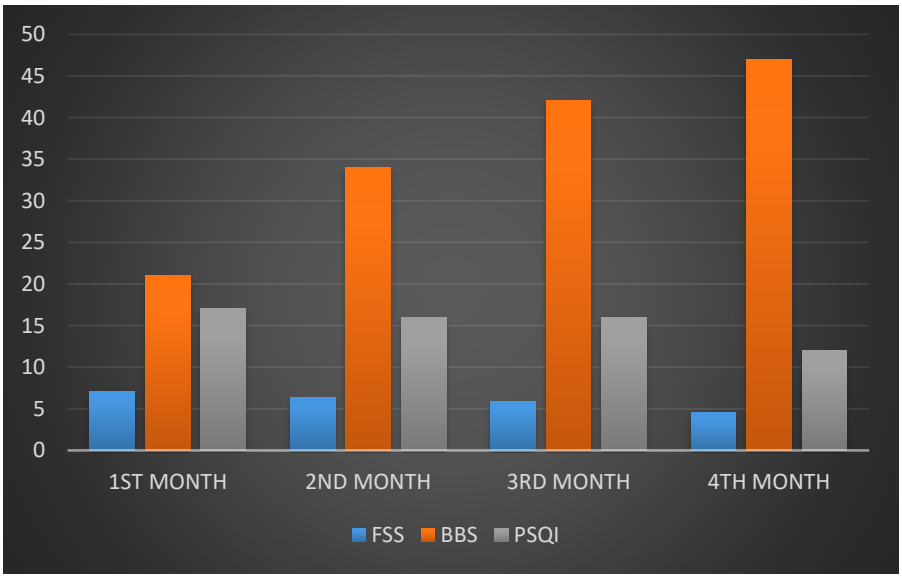
It has been observed that the following protocol was very useful for the patient in improving his fatigue levels; in the initial stages he found it difficult to cope up with the basic warm-up exercises as well. He was then given continuous positive re-enforcement and encouragement to reach the target. There were tremendous changes observed in the fatigue levels from 7.1 to 4.5

The protocol made a significant impact in the sleep cycle along with the improvement in the pattern; earlier he could sleep for 4/5 hours with scoring of 17 on PSQI which later on reduced the scoring to 12 at the end of the interventional period.

The major concern for the patient was with balance. At the beginning the subject scored 21 on berg balance scale which was at higher risk of fall. After the intervention the subject started maintaining balance and gained confidence along with score improvement to 47.

Outcome measure	Pre-Intervention Score	Post-Intervention Score
Fatigue Severity Scale (FSS)	7.1	4.5
Pittsburgh Sleep Quality Index (PSQI)	17	12
Berg Balance Scale (BBS)	21	47

Table 3: Comparison of pre and post interventional scores of all the outcome measures.



Graph 1: Comparison of post intervention scores across 4

DISCUSSION:

The present study was done to determine the effect of Yoga therapy along with Conventional physical therapy in Post Covid Hemiplegic Stroke patient on Fatigue, Sleep quality & balance. This study showed significant reduction in the fatigue levels post intervention as well as the sleep quality also improved. Balance and co-ordination also improved post intervention which led to reduced risk of falls and improved postural control during static & dynamic activities. This also led to improvement of gait pattern as well as patient overcame kinesophobia. Previous studies have shown that yoga has its effect in reducing fatigue and improving balance in stroke patients.

Miller KK, et al. in their pilot study proved that yoga is beneficial and plays a big role in improving balance post stroke. Forster A, et al. in their study concluded that improvement in balance leads to decreased rate of falls in patients with stroke.

Bastille JV, et al. in their study proved that yoga is beneficial in improving patient's condition in hemiparesis. Kartin D, et al. in their study hypothesized and proved that balance training during post stroke

Yognidra and meditation improved his sleep quality. Cope S, et al. proved that low impact exercises and yoga also improves sleep quality in patients hence promoting relaxation and mental conditioning in them.

CONCLUSION:

According to this case study, implementation of Yoga therapy in adjunct with Conventional physical therapy showed remarkable & noteworthy results in fatigue, sleep quality and balance outcomes post intervention in Post Covid Hemiplegic Stroke patient.

ADDITIONAL INFORMATION

Disclosures

Human subjects: Consent was obtained by all participants in this study.
Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following:
Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work.
Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.
Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

REFERENCES:

1. Lawrence, M., Celestino Junior, F. T., Matozinho, H. H. S., Govan, L., Booth, J., & Beecher, J. (2017). Yoga for stroke rehabilitation. Cochrane Database of Systematic Reviews, 2017(12). https://doi.org/10.1002/14651858.cd011483.pub2
2. Schmid, A. A., Van Puymbroeck, M., Altenburger, P. A., Schalk, N. L., Dierks, T. A., Miller, K. K., et al. (2012). Poststroke balance improves with yoga: A pilot study. Stroke, 43(9), 2402–2407. https://doi.org/10.1161/STROKEAHA.112.658211
3. Pulaski, K., Crepeau, E. B., & Schell, B. (2003). Willard & Spackman's occupational therapy. Philadelphia: Lippincott Williams & Wilkins.
4. Forster, A., & Young, J. (1995). Incidence and consequences of falls due to stroke: A systematic inquiry. BMJ, 311(6997), 83–86. https://doi.org/10.1136/bmj.311.6997.83
5. Schmid, A. A., & Rittman, M. (2009). Consequences of poststroke falls: Activity limitation, increased dependence, and the development of fear of falling. American Journal of Occupational Therapy, 63(3), 310–316. https://doi.org/10.5014/ajot.63.3.310
6. Schmid, A. A., & Rittman, M. (2007). Fear of falling: An emerging issue after stroke. Topics in Stroke Rehabilitation, 14(5), 46–55. https://doi.org/10.1310/tsr1405-46
7. Schmid, A. A., Van Puymbroeck, M., Knies, K., Spangler-Morris, C., Watts, K., & Damush, T. (2011). Fear of falling among people who have sustained a stroke: A 6-month longitudinal pilot study. American Journal of Occupational Therapy, 65(2), 125–132. https://doi.org/10.5014/ajot.2011.000737
8. Pang, M. Y. C., Eng, J. J., & Miller, W. C. (2007). Determinants of satisfaction with community reintegration in older adults with chronic stroke: Role of balance self-efficacy. Physical Therapy, 87(3), 282–291. https://doi.org/10.2522/ptj.20060142
9. Rogers, M. W., Martinez, K. M., Waller, S. M., & Gray, V. L. (2018). Recovery and rehabilitation of standing balance after stroke. In S. J. Winstein, J. R. Dromerick, & S. F. M. Edwards (Eds.), Stroke Recovery and Rehabilitation (2nd ed., pp. 485–503). Springer Publishing Company.
10. Lubetzky-Vilnai, A., & Kartin, D. (2010). The effect of balance training on balance performance in individuals poststroke: A systematic review. Journal of Neurological Physical Therapy, 34(3), 127–137. https://doi.org/10.1097/NPT.0b013e3181ef764d
11. Garrett, R., Immink, M. A., & Hillier, S. (2011). Becoming connected: The lived experience of yoga participation after stroke. Disability and Rehabilitation, 33(25–26), 2404–2415. https://doi.org/10.3109/09638288.2011.573058
12. RePORT. (n.d.). Recovery Act investment reports. National Institutes of Health. Retrieved May 12, 2023, from http://report.nih.gov/recovery/investmentreports/ViewARRAInvRpt.aspx?csid=277
13. Feuerstein, G. (n.d.). Yoga Therapy. Retrieved from http://www.iayt.org/yogatherapy.html
14. Bastille, J. V., & Gill-Body, K. M. (2004). A yoga-based exercise program for people with chronic poststroke hemiparesis. Physical Therapy, 84(1), 33–48. https://doi.org/10.1093/ptj/84.1.33
15. Cope, S., Feuerstein, G., Kraftsow, G., Lasater, J., & Miller, R. (2000). Toward a definition of yoga therapy: A panel discussion. International Journal of Yoga Therapy, 10(1), 5–10. https://doi.org/10.17761/ijyt.10.1.w5p850wk2qm8t778
16. Bell, L., & Seyfer, E. (2000). Gentle yoga: A guide to low-impact exercise. Ten Speed Press