

EFFECT OF YOGIC PRACTICES ON POST STROKE HEMIPLEGIA (PAKSHAGHATA) PATIENTS

Vaishali Arya¹, Mangalagowri V. Rao², K. N. Singh³

¹Assistant Professor, Department of Rachana Sharir, Ananya college of Ayurveda, Kalol institute of Techonlogy and Research Centre, Kalol, Gujrat-382721, India

²Associate Professor and Head, Department of Swasthavritta, All India Institute of Ayurveda, Gautam Puri, Sarita Vihar, New Delhi-110076, India

³Professor and Head, Department of Rachana Sharir, Faculty of Ayurveda, Banaras Hindu University, Varanasi-221005, India

Email: mangowri@gmail.com

ABSTRACT

Introduction: Hemiplegia is a disease characterised by affected movements to varying extent on one side of the body. In India 1.2 % of total deaths is due to stroke. The description of features of Pakshaghata or Pakshvadhya mentioned in the chapter of Vatavyadhi is exactly similar to Hemiplegia or stroke. The recovery with conventional therapy is slow and rehabilitation is needed. Yogic practices help to control the vayu through gaining control over body through Asanas and control over the breath through Pranayama and entire nervous system through meditative practices like Dhyana. Aims and **Objective:** To prove effect of Yogic practices on Pakshaghata (Post stroke Hemiplegia) patients. **Methodology:** 60 patients attending the OPD of neurology, S S Hospital, IMS, BHU were registered and randomly allocated into Control (With conventional therapy), and study Group intervention with selected Yogic practices for a duration of 4 months. Assessment was done at initial level after 2 months and at the end of trial i.e. 4 months. Various subjective and objective parameters showed significant effect on the Pakshaghata in intervention Group after 4 months study period. The observations were systematically recorded and analysed statistically by SPSS version 20.0. **Results:** The Yogic practices are effective in improving Aphasia, Sitting from lying down, Standing from sitting, Walking down stair, Increase in walking capacity and Hand grip power in Pakshaghata patients. **Conclusion:** Yogic practices can be used effectively as modality in the management of Hemiplegia.

Keywords: *Pakshaghata, Pranayama, Asana, Aphasia, Hand Grip power,*

INTRODUCTION

Hemiplegia is a disease characterised by affected movements to varying extent on one side of the body. Injury to the parts of the brain is responsible for regu-

lation of movements of the parts of the body like limbs, trunk, face etc. It is commonly known by the name stroke. The causative factor for the stroke may

be emboli, atherosclerosis, thrombus, infarct, tumour etc. The changing lifestyle has led to the alarming increase in the non-communicable lifestyle diseases including metabolic syndrome comprising of disorders like obesity, hypertension, dyslipidaemia, and diabetes mellitus resulting in the complications such as hemiplegia. Especially in India 1.2 % of total deaths is due to stroke¹. The studies show estimation between a range of 84-262/100,000 in rural and 334-424/100,000 in urban areas in India with respect to age-adjusted prevalence rate of stroke². The conventional management includes the physiotherapy and therapies to liquefy the clots and alleviate the raised blood pressure. The recovery is slow and rehabilitation is needed.

The description of features of *Pakshaghata* or *Pakshvadha* mentioned in the chapter of Vata vyadhi is exactly similar to Hemiplegia or stroke. In *Ayurveda* it is due to *Vata Karma Kshaya*. Further, disease becomes difficult to diagnose at an early stage as its premonitory symptoms are inconspicuous³. The management is difficult as *Marma* (Vital parts), *Asthi Sandhi* (Joints) is affected and hence disease comes under *Madhyama Roga Marga*. The features of *Pakshaghata* (Hemiplegia) and *Ardita* (Facial palsy) can exist together. According to *Ayurvedic* Classics, *Pakshaghata* is characterized by loss of function and mobility of half of the body either right or left, pain and disturbed speech. *Dhatukshaya* is also among the features.

In classics of Yoga, it has been mentioned that Asanas bring about sturdiness in the body⁴. The practice of *Yogic* exercises promotes positive health and prevents debilitating disorders. A hemiplegic patient faces problems performing simple of day today activities like walking, dressing, eating, and using the bathroom. Motor deficits can result from damage to the motor cortex in the frontal lobes of the brain or from damage to the lower parts of the brain, such as the cerebellum, which controls balance and coordination. The mechanical properties of muscle play an integral role in force generation; that is, a command from the nervous system to activate a muscle will generate varying levels of force depending on the state of that muscle. Muscles nevertheless, play a key role in some move-

ment and knowledge of this is of considerable importance in the diagnosis of muscle paralysis- an essential element in determining the presence, site, and degree of injury to nerves. Further, *Yogic* practices help to control the *Pranavayu* through gaining control over body through *Asanas* and control over the breath through *Pranayama* and entire nervous system through meditative practices like *Dhyana*.

Hence, this study was designed to prove the ancient doctrines on the modern scientific parameter.

Aim and Objectives

- To determine the effect of *Yogic* practices among *Pakshaghata* (Post stroke Hemiplegia) patients

Material and methods:

The randomised clinical study was first approved from the DRC of department of Sharira Rachana, followed by the approval of Post Graduate Medical Board of IMS and ethical committee of Institute of Medical Sciences, Banaras Hindu University. Total 60 cases of *Pakshaghata* (Post stroke Hemiplegia) falling under the inclusion criteria attending the OPD of Neurology, S.S. Hospital, BHU were registered. The patients were randomly allocated in to two groups after getting informed consent from the patients.

Inclusion Criteria

- Patients between age group 15-75 years.
- Patients diagnosed with *Pakshaghata* (Post stroke Hemiplegia) patients only.

Exclusion Criteria

- Abuse of drugs and alcohol.
- Patients of quadriplegia and paraplegia.
- Patients, suffering from respiratory disorders.
- Patients with altered sensorium.

Assessment Criteria

- Brooke's scale⁵
- Muscle strength scale⁶
- Range of motion of joints through Gonio meter⁷
- Handgrip Dynamometer- Handgrip Strength Test

Group A₁ - Control (Conventional therapy)

Group A₂- *Yogic* intervention

The Yogic Intervention included following Yogic practices

1. *Hasstothanasana* – 5 times
2. *Trikonasana* - 5 times
3. *Utthanapadasana*- 5 times
4. *Pavanamuktasana*- 5 times
5. *Bhujangasana* - 5 times
6. *Shavasana* – 15 minutes
7. *Nadishodhana* or *Anuloma viloma Pranayama*- 20 rounds
8. *Bhramari Pranayama*- 20 rounds

Further, the *Asanas* were modified according to the condition of individual patients and assistance was provided to the patients while performing *Asanas* as per requirement. The above mentioned *Yogic* practices were advocated up to a period of 4 months. The patients were assessed before treatment and at an interval of 2 months and after completion of treatment i.e at the end of 4 months by using the assessment criteria as mentioned earlier. The data were collected and observations noted in specially designed proforma for the study. The observations were tabulated in the Microsoft excel sheets and analysed using SPSS software 20.0.

Observation and Results:

Among the registered patients 45% patients had left sided hemiplegia and 55% had right sided hemiplegia. After the course of intervention with *Yogic* practices after 4 months, There was considerable decrease in severity of Brook scale (Table 1), Muscle strength scale (Table 2), *Vaksanga* (Aphasia) (Table 3), Finger movement (Table 4), standing from sitting (Table 5), foot pressure on weighing machine (Table 6), Walking time in 10 meter distance (Table 7), Deviation of face (Table 8). There was also significant decrease in systolic and diastolic blood pressure.

DISCUSSION

Over-all improvement was observed in different symptoms associated with Hemiplegia. This may be due to improvement in neurological functions due to effect of *Pranayama* which modulates *Udana* and

Pranavayu that are the *Vata* vitiated and removes obstruction in *Pakshaghata* patients⁸. The results are similar to the preliminary Study conducted by Julie V Bastille and Kathleen M Gill-Body (2004) on Yoga-Based Exercise Program for People With Chronic Poststroke Hemiparesis showed positive results with respect to Berg Balance Scale (BBS) and the Timed Movement Battery (TMB) after intervention with 1.5 hours *Yoga* session⁹. Improvement in Muscle power (Ref. Table No.2) may be due to enhancement of blood circulation due to *Asanas* and increase of fitness level due to practice of *Yoga*. Similar results were found in study done on elderly by Chen K.M. et al. (2010)¹⁰. The results of the present study suggested that the intervention of a planned *yoga* program led to significant improvement in the quality of health decreased the disability and *Vaksanga* (Aphasia) (Ref. Table No.3) for the patients who were diagnosed to have difficulty in speech. The effect on *Vaksanga* (Aphasia) may be due to improvement in acoustic and visual reaction time, overall improvement in language and decrease in aphasia due to *Yogic* practices. The results are similar to a study on stroke victims with aphasia regularly performing *Yogic* practices done by Lynton et al. (2007). Positive outcome were observed after *yoga* therapy. The improvement of sit to stand test performance may be due to improvement in static motor performance due to proper balance of body and mind resulting due to constant *Yoga* practice (Ref. Table No.5). Similar results were recorded by Telles et al in the study entitled Plasticity of Motor Control Systems Demonstrated by *Yoga* training¹¹. Probably mental factors like depression were counteracted by *Yogic* practices like *Shavasana*, *Pranayama*, thus enhancing cognitive function of patients. Improvement in walking time (Ref. Table No.6) for 10 meters may be due to enhanced muscle strength, coordination, and balance and fitness level of patient. Similar findings were observed in the study by Meng Ni et al, Laboratory of Neuromuscular Research and Active Aging, University of Miami¹².

Observational Table 1: Showing the effect of Yogic practices on Brook scale

Group	Grade	Brook scale Number and % of cases			Within the group comparison Friedman test
		BT	F1	F2	
Patient Control	Abduct arm in full circle until they touch above head	0 (0.0%)	0 (0.0%)	1 (3.3%)	$\chi^2=17.575$ p=0.000
	Raise arm above head only by flexing the elbow	4 (13.3%)	7 (23.3%)	9 (30.0%)	
	Cannot raise hands above head but raise 8-oz glass to the mouth	12 (40.0%)	14 (46.7%)	15 (50.0%)	
	Can raise hands to the mouth, but cannot raise an 8-oz glass to the mouth	10 (33.3%)	7 (23.3%)	4 (13.3%)	
	Cannot raise hands to mouth, but can hold pen or pick up pennies	4 (13.3%)	2 (6.7%)	1 (3.3%)	
	Cannot raise hands and has no useful function of hands	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Patient Intervention	Abduct arm in full circle until they touch above head	0 (0.0%)	0 (0.0%)	13 (43.3%)	$\chi^2=59.051$ p=0.000
	Raise arm above head only by flexing the elbow	0 (0.0%)	9 (30.0%)	13 (43.3%)	
	Cannot raise hands above head but raise 8-oz glass to the mouth	11 (36.7%)	14 (46.7%)	4 (13.3%)	
	Can raise hands to the mouth, but cannot raise an 8-oz glass to the mouth	12 (40.0%)	5 (16.7%)	0 (0.0%)	
	Cannot raise hands to mouth, but can hold pen or pick up pennies	5 (16.7%)	2 (6.7%)	0 (0.0%)	
	Cannot raise hands and has no useful function of hands	2 (6.7%)	0 (0.0%)	0 (0.0%)	
Between group comparison Chi- square		$\chi^2=6.336$ p=0.175	$\chi^2=0.583$ p=0.900	$\chi^2=22.381$ p=0.000	

Observational Table 2: Showing the effect of Yogic practices on Muscle strength scale

Group	Grade	Muscle strength scale Number and % of cases			Within the group comparison Friedman test
		BT	F1	F2	
Patient control	Total paralysis	0 (0.0%)	0 (0.0%)	0 (0.0%)	$\chi^2=18.659$ p=0.000
	Flicker movements only	5 (16.7%)	0 (0.0%)	1 (3.3%)	
	Unable to overcome gravity	6 (20.0%)	7 (23.3%)	3 (10.0%)	
	Able to overcome gravity but not resistance	8 (26.7%)	9 (30.0%)	10 (33.3%)	
	Able to overcome gravity and mild resistance	5 (16.7%)	7 (23.3%)	7 (23.3%)	
	Able to overcome gravity and moderate resistance	6 (20.0%)	6 (20.0%)	7 (23.3%)	
	Able to overcome gravity and resistance but strength not normal	0 (0.0%)	1 (3.3%)	2 (6.7%)	
Normal motor power	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Patient intervention	Total paralysis	0 (0.0%)	0 (0.0%)	0 (0.0%)	$\chi^2=51.322$ p=0.000
	Flicker movements only	4 (13.3%)	0 (0.0%)	1 (3.3%)	
	Unable to overcome gravity	8 (26.7%)	5 (16.7%)	0 (0.0%)	
	Able to overcome gravity but not resistance	8 (26.7%)	9 (30.0%)	0 (0.0%)	
	Able to overcome gravity and mild resistance	9 (30.0%)	6 (20.0%)	5 (16.7%)	
	Able to overcome gravity and moderate resistance	1 (3.3%)	10 (33.3%)	12 (40.0%)	
Able to overcome gravity and resistance but strength not normal	0 (0.0%)	0 (0.0%)	12 (40.0%)		

	Normal motor power	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Between group comparison		$\chi^2=5.111$	$\chi^2=2.410$	$\chi^2=21.792$	
Chi- square		p=0.276	p=0.661	p=0.001	

Observational Table 3: Showing the effect of Yogic practices on *Vaksanga* (Aphasia)

Group	Grade	<i>Vaksanga</i> Number and % of cases			Within the group comparison Friedman test
		BT	F1	F2	
Patient control	Normal	4 (13.3%)	6 (20.0%)	10 (33.3%)	$\chi^2=21.775$ p=0.000
	speak with difficulty	9 (30.0%)	12 (40.0%)	12 (40.0%)	
	speak few words	9 (30.0%)	7 (23.3%)	7 (23.3%)	
	utter voice	7 (23.3%)	5 (16.7%)	1 (3.3%)	
	Aphasia	1 (3.3%)	0 (0.0%)	0 (0.0%)	
Patient interven- tion	Normal	0 (0.0%)	2 (6.7%)	17 (56.7%)	$\chi^2=56.214$ p=0.000
	speak with difficulty	6 (20.0%)	12 (40.0%)	9 (30.0%)	
	speak few words	9 (30.0%)	10 (33.3%)	4 (13.3%)	
	utter voice	10 (33.3%)	6 (20.0%)	0 (0.0%)	
	Aphasia	5 (16.7%)	0 (0.0%)	0 (0.0%)	
Between group comparison		$\chi^2=7.796$	$\chi^2=2.620$	$\chi^2=4.062$	
Chi- square		p=0.099	p=0.454	p=0.255	

Table 4: Showing the effect of Yogic practices on Finger movement

Group	Grade	Finger movement Number and % of cases			Within the group comparison Friedman test
		BT	F1	F2	
Patient control	Able to hold object	2 (6.7%)	6 (20.0%)	13 (43.3%)	$\chi^2=39.308$ p=0.000
	Unable to hold object	13 (43.3%)	14 (46.7%)	16 (53.3%)	
	Slight movement	12 (40.0%)	10 (33.3%)	1 (3.3%)	
	No movement	3 (10.0%)	0 (0.0%)	0 (0.0%)	
Patient interven- tion	Able to hold object	0 (0.0%)	2 (6.7%)	27 (90.0%)	$\chi^2=54.889$ p=0.000
	Unable to hold object	11 (36.7%)	20 (66.7%)	3 (10.0%)	
	Slight movement	12 (40.0%)	8 (26.7%)	0 (0.0%)	
	No movement	7 (23.3%)	0 (0.0%)	0 (0.0%)	
Between group comparison		$\chi^2=3.767$	$\chi^2=3.281$	$\chi^2=14.795$	
Chi- square		p=0.288	p=0.194	p=0.001	

Table 5: Showing the effect of Yogic practices on standing from sitting

Group	Grade	Standing from sitting Number and % of cases			Within the group comparison Friedman test
		BT	F1	F2	
Patient control	Normal	0 (0.0%)	0 (0.0%)	3 (10.0%)	$\chi^2=34.880$ p=0.000
	Without support	5 (16.7%)	12 (40.0%)	18 (60.0%)	
	With support	18 (60.0%)	15 (50.0%)	9 (30.0%)	
	Unable	7 (23.3%)	3 (10.0%)	0 (0.0%)	
Patient intervention	Normal	0 (0.0%)	0 (0.0%)	7 (11.7%)	$\chi^2=50.057$ p=0.000
	Without support	0 (0.0%)	10 (33.3%)	43 (71.7%)	
	With support	17 (56.7%)	20 (66.7%)	10 (16.7%)	
	Unable	13 (43.3%)	0 (0.0%)	0 (0.0%)	
Between group comparison		$\chi^2=6.829$	$\chi^2=3.896$	$\chi^2=7.682$	
Chi- square		p=0.033	p=0.143	p=0.021	

Table 6: Showing the effect of Yogic practices on walking time in 10 meter distance

Group	Grade	Walking time in 10 meter distance Number and % of cases			Within the group comparison Friedman test
		BT	F1	F2	
Patient control	More than 2 min	4 (13.3%)	10 (33.3%)	3 (10.0%)	$\chi^2=35.677$ p=0.000
	Between 1:30-2 min	15 (50.0%)	10 (33.3%)	15 (50.0%)	
	Between 1-1:30 min	3 (10.0%)	9 (30.0%)	9 (30.0%)	
	Less than 1 min	7 (23.3%)	0 (0.0%)	2 (6.7%)	
	Cannot walk	1 (3.3%)	1 (3.3%)	1 (3.3%)	
Patient intervention	More than 2 min	0 (0.0%)	1 (3.3%)	1 (3.3%)	$\chi^2=58.207$ p=0.000
	Between 1:30-2 min	4 (13.3%)	9 (30.0%)	15 (50.0%)	
	Between 1-1:30 min	7 (23.3%)	14 (46.7%)	11 (36.7%)	
	Less than 1 min	13 (43.3%)	6 (20.0%)	3 (10.0%)	
	Cannot walk	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Between group comparison Chi- square		$\chi^2=17.340$ p=0.002	$\chi^2=15.503$ p=0.004	$\chi^2=2.400$ p=0.663	

Observational Table 7: Showing the effect of Yogic practices on Deviation of face

Group	Grade	Deviation of face Number and % of cases			Within the group comparison Friedman test
		BT	F1	F2	
Patient control	No deviation of face	22 (73.3%)	23 (76.7%)	25 (83.3%)	$\chi^2=5.375$ p=0.068
	Slightly present	5 (16.7%)	6 (20.0%)	4 (13.3%)	
	Moderately present	3 (10.0%)	1 (3.3%)	1 (3.3%)	
Patient intervention	No deviation of face	24 (80.0%)	24 (80.0%)	25 (83.3%)	$\chi^2=6.500$ p=0.039
	Slightly present	3 (10.0%)	4 (13.3%)	9 (15.0%)	
	Moderately present	3 (10.0%)	2 (6.7%)	1 (1.7%)	
Between group comparison Chi- square		$\chi^2=0.587$ p=0.746	$\chi^2=0.755$ p=0.686	$\chi^2=1.111$ p=0.574	

Table 8: Showing the effect of Yogic practices on Foot pressure on weighing

Group	Grade	Foot pressure on weighing machine Number and % of cases			Within the group comparison Friedman test
		BT	F1	F2	
Patient control	Above 40 kg	0 (0.0%)	0 (0.0%)	0 (0.0%)	$\chi^2=27.922$ p=0.000
	30-40kg	0 (0.0%)	3 (10.0%)	6 (20.0%)	
	20-30 kg	10 (33.3%)	12 (40.0%)	15 (50.0%)	
	10-20 kg	12 (40.0%)	13 (43.3%)	7 (23.3%)	
	0-10 kg	8 (26.7%)	2 (6.7%)	2 (6.7%)	
Patient intervention	Above 40 kg	0 (0.0%)	0 (0.0%)	3 (10.0%)	$\chi^2=56.619$ p=0.000
	30-40 kg	0 (0.0%)	1 (3.3%)	19 (63.3%)	
	20-30 kg	3 (10.0%)	17 (56.7%)	8 (26.7%)	
	10-20 kg	17 (56.7%)	12 (40.0%)	0 (0.0%)	
	0-10 kg	10 (33.3%)	0 (0.0%)	0 (0.0%)	
Between group comparison Chi- square		$\chi^2=4.854$ p=0.088	$\chi^2=3.902$ p=0.272	$\chi^2=20.890$ p=0.000	

CONCLUSION

The Intervention significantly improves the activities of daily living of Hemiplegia patients recorded by improvement in Aphasia, facial deviation, finger movement, muscle strength, hand grip power standing from sitting, walking time for 10 meters. Hence Yogic practices can be used effectively as modality in the management of Hemiplegia.

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Source of Support: Nil

Conflict Of Interest: None Declared

How to cite this URL: Mangalagowri V. Rao et al: Effect Of Yogic Practices On Post Stroke Hemiplegia (Pakshaghata) Patients. *International Ayurvedic Medical Journal* {online} 2019 {cited July, 2019} Available from: http://www.iamj.in/posts/images/upload/1085_1091.pdf