Case Report

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Quick Response Code:

Website: www.ayucare.org

DOI: 10.4103/jacr.jacr_71_21

Customized Ayurveda approaches in modulating brain injury: A case report

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Abstract:

Cerebrovascular stroke is the most common source of neurological debility in the present adult population worldwide. Its manifestation, symptoms, and pathogenesis can be understood with *Pakshaghata* (~cerebrovascular stroke) in Ayurvedic parlance. This can be managed through Ayurveda principles with appropriate *Panchakarma* procedures and oral medications. A case of 23-year-old male who was diagnosed with sudden severe stroke of totally dependent and severe disability with intracranial acute hematoma and hemorrhagic abnormalities was successfully treated with planned Ayurveda interventions. Significant improvement in the degree of disability was found and the interventions modulated him into partially dependent and moderate disability. The minimal strategic intervention used resulted in the significant recovery in overall quality of life. Consequently, the study validates that the treatment planned with Ayurveda principles along with suitable *Panchakarma* therapies and oral medications has a potential role in the management of *Pakshaghata*.

KEYWORDS: Cerebrovascular stroke, *Pakshaghata*, *Panchakarma*

INTRODUCTION

Cerebrovascular stroke is the most common source of neurological debility in the present adult population worldwide.[1] Its frequency increases with age, and is higher in men than women.[2] The portrayal of the clinical signs and symptoms of cerebrovascular stroke can be understood with the *Pakshaghata* (~cerebrovascular stroke) in Ayurveda science. The disease *Pakshaghata* has been registered among the eighty forms of *Vata vyadhi* (~disorders of *Vata*).[3] The manifestations of *Pakshaghata* can be managed through appropriate *Panchakarma* (~five intensive treatment modalities) procedures along with suitable internal medicines as described in the classics,[4] and rehabilitation therapies through Ayurveda are reported to be credible options in the rehabilitating stroke survivors holistically.[5] Majority of the patients were found to benefit not only in self-efficacy domains but also in the domains of positive health behaviors and emotional well-being. Inpatient rehabilitation facilities have been reported to foster patient abilities to cope with such disabilities. It was also noted that the follow-up cases after three months of composite treatment plan of *Ayurvedic* oral medications and *Panchakarma* procedures significantly improved existing neurological deficits and quality of life.[6]

A case of traumatic brain injury due to a road traffic accident, managed with Ayurveda after initially been kept under modern neurological care, showed encouraging outcomes. The whole course of Ayurvedic therapy began two weeks after the initial trauma, continued for about three months, and resulted in coma reversal with near-complete recovery.[7]

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Submitted: 25-Aug-2021
Revised: 07-May-2022
Accepted: 13-May-2022
Published: 28-Jun-2022

How to cite this article: Nithin SA, Belaguli G, Mohan K. Customized Ayurveda approaches in modulating brain injury: A case report. J Ayurveda Case Rep 2022;5:68-73.

Studies have also established the importance of *Panchakarma* procedures along with Ayurvedic internal medications improving quality of life of individual suffered with stroke.[3]

Adopting Ayurveda procedures like *Abhyanga* was well tolerated in self-selected patients who were one month post stroke. These self-selected patients improved faster in standing and had better locomotion at discharge. Various medicated oils used here restored internal homeostasis, promoting recovery. It promoted faster gains possibly by either modulating interneuron activity promoting spasticity or improving selective voluntary motor control. It was believed that the *Abhyanga* modulated the unregulated alpha moto-neuron overactivity that caused spasticity, yielding better outcomes.[8] All these studies infer about the importance of Ayurveda procedures in the management of stroke and related manifestations.

PATIENT INFORMATION

A 23-year-old male was brought to hospital on May 4, 2021, with fresh complaints of loss of fine movements and cold extremities, excessive sweating of right upper and lower limb, associated with unclear speech for 10 days. Previously, on April 25, 2021, he was diagnosed with cerebrovascular stroke with midbrain and pontine bleed with intraventricular extension. After primary treatments, he was referred to a higher center from there on April 30, 2021. At higher center, he was intubated and was treated with the support of mechanical ventilation in Intensive Care Unit (ICU) for nearly four days. He underwent and was treated symptomatically for multiple uncertain events such as fall in blood pressure, heart rate, impaired oxygen saturation level, and altered sensorium during his stay in ICU, and eventually, he was referred back to home stating high risk of mortality. The worried family members shifted him to hospital on May 4, 2021, for a try with Ayurveda intervention. On his arrival, he was on stature, on Ryle's tube feed, and with Foley's catheter.

CLINICAL FINDINGS

On noticing, he was severely dehydrated, drowsy, but oriented, cooperative, and was obeying oral commands. His vitals were stable. His central nervous system examination marked right-sided hemiplegia with severe motor and sensory deficits with Glasgow Coma Scale of 13/15 ($E_3V_4M_6$) and hemiplegic gait. The tone and muscular bulk in the right upper and lower limb was declined and rigid. With the power of 1–2, the reflexes were nil at the right upper limb and extensor plantar reflexes were present at the right lower limb.

DIAGNOSTIC ASSESSMENT

The degree of disability was measured following Scandinavian Stroke Score,[9] Barthel Index Score,[10] and Modified Rankin Scale.[11] It measured 13 (severe stroke), 0 (total dependence), and 5 (severe disability), respectively. Table 1 represents the impression of multiple Computed Tomography (CT) brain imaging done.

TIMELINE AND THERAPEUTIC INTERVENTION

The advised oral medications (third-generation cephalosporin and racetam anticonvulsant) were continued for five days. Ayurvedic interventions were started from the 6th day (May 8, 2021). The whole treatment schedule opted was based on classical description consisting of topical treatments and oral medications. Table 2 depicts the external treatment plan, and Table 3 represents the oral medications. Figure 1 represents the schematic classification of the intervention.

FOLLOW-UP AND OUTCOME

The assessments through Scandinavian Stroke Scale, Barthel Index Scale, Modified Rankin Scale and CT imaging of brain were documented as before treatment (on the 0th day – May 8, 2021) and after treatment (on the 45th day – June 21, 2021). The observations and results are provided in Tables 4-7.

DISCUSSION

From an Ayurveda perspective, cerebrovascular stroke is considered *Pakshaghata*. It is a disease attributed to an aberration of *Vatadosha*. The diverse treatments advocated in Ayurveda for this disease are to primarily harmonize the aberrant physiology.[12] Acharya Charaka, describes that morbid *Vata* beholds either side of the body, dries up *Sira* (~any tubular vessel of the body) and *Snayu* (~sinew) of that part rendering it lifeless and producing a loss of motor activity with pain and *Vakstambha* (~impediment of speech/dysphagia).[13] In addition, its pathogenesis

Table 1: Impressions of brain imaging (CT brain)

Date	Impressions of brain imaging (CT brain)
April 25, 2021	Acute intraparenchymal hematoma (30 mm×29 mm×18 mm) noted in midbrain and pons to left of midline with intraventricular extension into the 4th ventricle
April 30, 2021	Acute hemorrhage (2.8 cm×1.7 cm×3.4 cm) involving left hemipons, left middle cerebellar peduncle, and left half of the midbrain

CT: Computed tomography

Table 2: The external treatment schedule

Duration	Treatment schedule
8th to 14th May 2021 (7 days)	*Agnilepa** on the right side of his body in quantity sufficient dose
15th to 24th May 2021 (10 days)	*Shiropichu* with *Brahmitaila* in quantity sufficient dose
20th May 2021 to 16th June 2021 (28 days)	*Sarvanga abhyanga* with *Ksheerabala taila* and *Dhanwantara taila* followed with *Shashti kashali panda sweda*
21st to 27th May 2021 (7 days)	*Pratimarsha nasya* with *Ksheerabala taila* 101 (6 drops in each nostril)
	Sthanika lepa with *Rasna churna* on forehead in quantity sufficient dose
	Physiotherapy as advised
	Mukhabhyanaga with *Ksheerabala taila* followed by *Panasapatra sweda*
23rd to 30th May 2021 (8 days)	60 ml *Matra basti* with *Kalyanaka ghrita*
31st May 2021 to 15th June 2021 (16 days)	*Dashamooladi niruha*† *Kala basti* schedule‡ (60 ml *Anuvasana basti*, 385 ml *Niruha basti*)
17th to 21st June 2021 (5 days)	*Sarvanga utsadana*§ and *Nadi sweda*

**Agnilepa–Special paste made up of parts of Moringa oleifera; Ocimum basilicum; Syzygium aromaticum; Allium sativum; Piper nigrum, Curcuma longa, Ricinus communis* and *Brassica juncea*. †*Niruhabasti* with Honey (50 gms); Rock salt (10 gms); *Kalyanaka ghritha* (100 ml); *Dashamoola kashaya* (200 ml); *Shatapushpa kalka* (25 gms) and *Anuvasana basti* with *Kalyanaka ghritha* (60 ml). ‡Alternative nine *Anuvasana* and seven *Niruha basti*. §*Sarvanga utsadana* with medicated powder of *Macrotyloma uniflorum, Hordeum vulgare, Vigna radiata, Cyperus rotundus, Emblica officinalis, Terminalia chebula, Terminalia bellirica, Trigonella foenum-graecum, Curcuma longa* and *Brassica juncea*

Table 3: Oral medications

	Medicines	Prescription
1	Tab. Anuloma DS	1200 mg at bed time
2	Tab. Brihat vata chintamani (Plain)	150 mg in the morning after breakfast
3	Cap. Palsinuron	360 mg twice daily in the morning and evening before half an hour of food
4	Syp. Dhanadhanayanadi Kashaya	10 ml twice daily in the morning and evening with half glass of warm water before food
5	Syp. Ural SF	5 ml thrice daily after food

Tab – Tablet; Cap- Capsule; Syp– Syrup

can include *Margaavarna* (~obstruction of channels), *Dhatukshaya* (~diminution of *Dhatu*/emaciation), and *Vama* or *Dakshinachestanivritti* (~deficit of motor functions in any side of the body).[14] With these, the cardinal features of *Pakshaghata* can include *Chestahani* (~deficits in sensory and motor functions), *Hasta-padasankocha* (~increased muscular tone or rigidity of limbs), *Ruja* (~pain), *Vakstambha*, *Sandhibandha vimoksha* (~weakness of joints), and *Sira-snayu-shosha* (~wasting of veins and tendons).[15]

There is also a similar theory which states that the disease *Pakshaghata* is due to vitiation of *Vata dosha*

Table 4: Assessment of the intervention with Scandinavian Stroke Score

Scandinavian score	Range of score	Before treatment (0th day)	After treatment (45th day)
Consciousness	2–6	4	6
Eye movement	0–4	3	4
Arm motor power (right)	0–6	1	5
Hand motor power (right)	0–6	0	5
Leg motor power (right)	0–6	0	5
Orientation	0–6	2	6
Speech	0–10	1	8
Facial palsy	0–2	1	2
Gait	0–12	1	10
Total	0–25 (severe) 26–42 (moderate) 43–58 (mild)	13	51

and *Sthanasamshraya* (~stage of localization) in the *Khavaigunya* (~vacant spaces), leading to the formation of the *Lakshana*s (~symptoms). The treatment plan is mainly to control the aggravated *Vatadosha*, based on the *Dosha-doshya* (~combination of vitiated *Dosha*s with weak and prone tissues), *Vriddi-kshaya* (~increased or decreased *Dosha*), *Sama-nirama* (~association or dissociation of *Ama* with *Vatadosha*), and *Avarana-lakshana* (~symptoms occurred due to enveloping *Dosha* on other) of the *Dosha* expressed by *Sthanadusti* (~vitiation of the entire system).[16]

The above two discussions are the most acceptable hypothetical reviews of *Pakshaghata*. Based on these theories, interventions were planned for the present case. First, in the external therapies, the *Agnilepa* (~application of special paste made up of medicinal herbs) and *Sthanikalepa* (~local application of paste of medicines) were used on the dearth right side of the body and on the forehead, respectively. As his aggravated *Vatadosha* had *Avrita* (~enveloped) by other two *Dosha*s (*Pitta* and *Kapha*), drugs of *Agnideepana* (~appetizers of metabolic fire), *Amapachana* (~digestives of undigested toxins), and *Srotoshodhana* (~cleansers of channels) were selected for the action of neutralizing and scraping out the *Avrita dosha*. This action created a targeting pathway to treat the single aggravated *Vata dosha*.

Once this pathway was cleared, a set of *Panchakarma* therapies were induced to desolate the aggravated *Vata dosha*. The *Snehana* (~oleation therapy), *Nasya* (~medications through nasal route), *Basti karma* (~medicated enema therapy), *Swedana* (~sudation therapy), and *Mruduvirechana* (~elimination therapy) were induced. The drugs that had *Brihmana* (~restorative measures) and *Rasayana* (~rejuvenation) properties were selected for

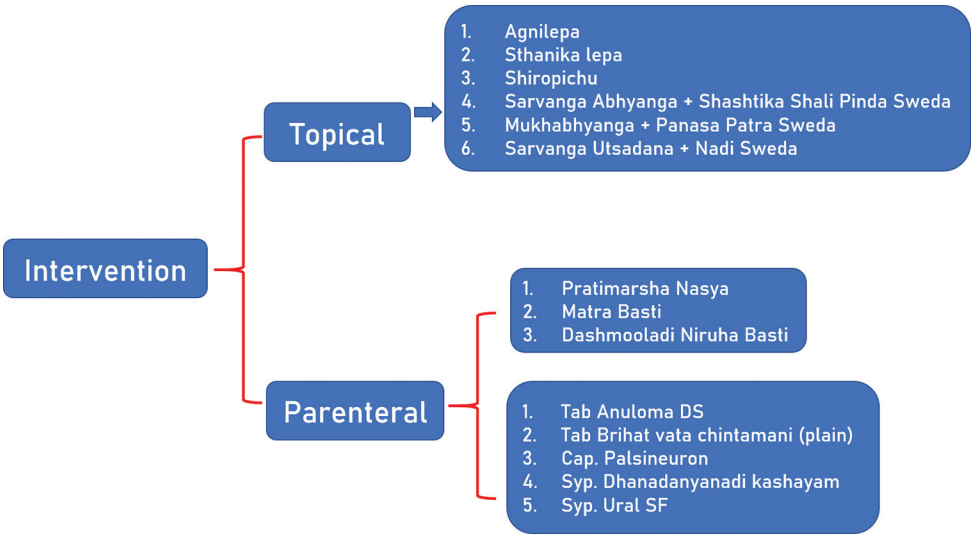

Figure 1: Schematic representation of the interventions

Table 5: Assessment of the intervention with Barthel Index Scale

Barthel score	Range of score	Before treatment (0th day)	After treatment (45th day)
Feeding	0–10	0	5
Bathing	0–5	0	5
Grooming	0–5	0	0
Dressing	0–10	0	5
Bowels	0–10	0	10
Bladder	0–10	0	5
Toilet use	0–10	0	5
Transfers (bed to chair and back)	0–15	0	5
Mobility (on level surface)	0–15	0	10
Stairs	0–10	0	5
Total	100	0	55

<20 – Total dependence; 20–39 – Very dependent; 40–59 – Partially dependent; 60–79 – Minimally dependent ; 80–100 – Able to live independently

the first two therapies. *Langhana* (~eliminators of excess toxins), *Amahara* (~scrapers of undigested *Ama* and *Kapha dosha*), and *Vatahara* (~normalizers of the aggravated *Vata dosha*) properties were selected for the last three sets of treatments. *Snehana* therapies such as *Shiropichu* (~a procedure of applying oil on the head using cotton pad), *Sarvanga abhyanga* (~synchronized whole body massage with medicated oil), and *Mukhabhyanga* (~facial massage with medicated oil) *Swedana* therapies like *Shashtika shali pinda* (~pouch of Oryza *sativa* L.), *Panasa patra* (~leaf of *Artocarpus heterophyllus* Lam.), *Sarvanga utsadana* (~synchronized whole body massage with medicated powder of *Macrotyloma uniflorum* (Lam.) Verdc., *Hordeum vulgare* L., *Vigna radiata* (L.) R.Wilczek , *Cyperus rotundus* L., *Emblica officinalis* L., *Terminalia chebula* (Gaertn.) Retz, *Terminalia bellirica* (Gaertn.) Roxb., *Trigonella foenumgraecum* L., *Curcuma longa* L. and *Brassica juncea* (L.) Czern.) with *Nadisweda* (~sudation using pipe-like instrument) were used. The selection of suitable medicines and the above stipulated sets of treatment [Tables 2 and 3] might have resulted in the lubrication, reduction of stiffness, dryness, and rejuvenation to the deficient nerves and muscles.[17] The same set of interventions, mainly *Pratimarsha nasya* (~low-dose medication through nasal route) and *Mukhabhyanga,* might have restored his intracranial abnormality. The *Pratimarsha nasya* helps to expel the vitiated *Dosha* from the vital center from the body.[18] Thus, it might have uprooted the intracranial abnormality. In the present study, *Ksheerabala taila* might have acted as *Vatahara*, *Brihmana*, *Rasayana,* and *Snehana*. At the time of discharge, he was partially dependent with moderate disability. He is currently on regular follow-up with *Shamanoushadi* (~discharge medicines).

CONCLUSION

The uncommon nature of the disease in a young adult; the minimal strategic intervention used that resulted in the significant recovery in his overall quality of life was believed to be worth documenting. A 23-year-old young male adult of severe stroke of totally dependent and severe disability with intracranial acute hematoma and hemorrhagic abnormalities was successfully treated with Ayurvedic intervention for 45 days. The peripheral external and internal treatments that had *Agnideepana, Amapachana,* and *Srotoshodana* might have helped in scraping out the enveloped *Pitta* and *Kapha dosha* from vitiated *Vata dosha*. Once vitiated *Vata dosha* was left alone, the sets of

Table 6: Assessment of the intervention with Modified Rankin Scale

Patients domain	Score	Before treatment (0th day)	After treatment (45th day)
No symptoms	0	-	-
No significant disability despite symptoms, able to carry out all usual duties and activity	1	-	-
Slight disability, unable to carry out all previous activity, but able to look after own affairs without assistance	2	-	-
Moderate disability, requiring some help, but able to walk without assistance	3	-	-
Moderate severe disability, unable to walk and attend to bodily needs without assistance	4	-	4
Severe disability, bedridden, incontinent, requiring constant nursing care, attention	5	5	-
Dead	6	-	-

Table 7: Assessment of the intervention with brain imaging (CT brain)

Timeline	Date	Impression
Before treatment (0th day)	April 25, 2021	Acute intra parenchymal hematoma (30 mm×29 mm×18 mm) noted in midbrain and pons to left of midline with intraventricular extension into the 4th ventricle
	April 30, 2021	Acute hemorrhage (2.8 cm×1.7 cm×3.4 cm) involving left hemipons, left middle cerebellar peduncle, and left half of the midbrain
After treatment (45th day)	June 16, 2021	No significant intracranial abnormalities observed

CT: Computed tomography

Panchakarma treatments and oral medications might have helped as *Brihmana*, *Rasayana*, *Langhana*, *Amahara,* and *Vatahara*. This action might have resulted in lubrication, reduction of stiffness, dryness, and rejuvenation to the dearth nerves and muscles, resolving the intracranial hemorrhage. There was a significant improvement in his degree of disability as per the Scandinavian Stroke Score, Barthel Index Score, and Modified Rankin Scale; it measured 51, 55, and 4, respectively, after the intervention. His concluding CT brain notified the normal intracranium. At the time of discharge, he was honored with refurbished nervous system, normal brain, and increased quality of life.

Recommendations

Subsequent to the conclusion, the study certifies that the planned treatment of suitable *Panchakarma* therapies and oral medications based on Ayurveda principles has a nontoxic and proficient role in managing *Pakshaghata*. Although the evidence obtained here is derived from a single sample, a robust design for large samples can be drawn to guide the practitioners, scholars, and the patients from the present study. The prerequisite for considering the efficacy of this type of study is still vital and is recommended for suitable advanced researches.

Acknowledgment

The authors are obliged to the patient and his family members for their prized consent, endurance, and kind support. The authors also extend their salutation to the entire hospital staff that directly or indirectly revitalized the willpower of the patient.

Declaration of patient consent

Authors certify that they have obtained patient consent form, where the patient has given his consent for reporting the case along with the images and other clinical information in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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