

# Integrative Management of Chronic Cerebral Venous Sinus Thrombosis with Ayurveda and Physiotherapy: A Case Report

MOHNISH V GOKHALE<sup>1</sup>, VAISHALI KUCHEWAR<sup>2</sup>, ASHVINI PARDHEKAR<sup>3</sup>, VINAY NARA<sup>4</sup>

## ABSTRACT

Chronic Cerebral Venous Sinus Thrombosis (CVST) is a rare but potentially debilitating condition involving thrombi in the venous sinuses of the brain, impairing venous drainage and increasing intracranial pressure. This condition is often challenging to diagnose due to its nonspecific symptoms, and it may present in various forms, from acute to chronic, often mimicking other neurological disorders. A 54-year-old male presented with persistent headaches, slurred speech, and imbalance, later confirmed as chronic CVST via Magnetic Resonance Imaging (MRI) venography. Despite well-controlled hypertension, the patient had a history of cerebrovascular insult, further complicating the clinical picture. What makes this case unique is the chronic presentation with partial sinus recanalisation and stable neurological function, achieved through a structured integrative approach. Ayurvedic therapies like *Shiro Basti*, *Matra Basti*, and *Rasayana* medications, combined with targeted physiotherapy, played a crucial role in recovery. Diagnostic findings such as a *Vata-Pitta* imbalance and therapeutic International Normalised Ratio (INR) range also contributed to the individualised treatment plan. This case highlights the value of integrative medicine in chronic neurovascular disorders, emphasising the role of Ayurveda and physiotherapy in improving clinical outcomes, preventing recurrence, and restoring quality of life. This case highlights the promising role of integrating Ayurveda and physiotherapy in managing chronic CVST. The combination of these therapies led to significant clinical improvements, suggesting their potential in enhancing neurovascular recovery. Further studies are needed to solidify these approaches in chronic neurological rehabilitation.

**Keywords:** Alternative medicine, Chronic disease, Neurorehabilitation, Stroke rehabilitation, Venous thrombosis

## CASE PRESENTATION

A 54-year-old male patient visited the department of Kayachikitsa with complaints of persistent headaches, slurred speech, and imbalance for a month. The patient expressed difficulty in walking and occasional dizziness for a month, which significantly limited his routine daily activities. There was no significant medical history. Family history revealed hypertension in both parents but no known cases of strokes, thrombotic events, or hereditary clotting disorders. Additionally, there was no family history of bronchial asthma or Chronic Obstructive Pulmonary Disease (COPD). Personal history revealed a mixed diet with a frequent intake of spicy and fried foods. He denied tobacco or alcohol use. His sleep was disturbed due to the persistent headaches, but his bowel and bladder function were normal. The symptoms started insidiously, beginning with mild headaches that gradually worsened. Slurred speech and imbalance set in later, for which the patient sought medical attention. There was no history of seizures or loss of consciousness.

Upon admission, the patient's vital parameters were as follows: blood pressure was 130/80 mmHg, pulse rate was 78 beats per minute, respiratory rate was 18 breaths per minute, temperature was afebrile, and SpO<sub>2</sub> was 98% on room air. The patient had a history of systemic hypertension diagnosed 10 years ago, which was well-controlled with medication. The blood pressure reading in the clinical examination was 130/80 mmHg. The respiratory system showed clear bilateral air entry with no added sounds. The abdomen was soft, non-tender, and without organomegaly. Neurologically, the patient was conscious and oriented, though slurred speech, mild ataxia, and imbalance were noted, with cranial nerves remaining intact. The cardiovascular examination had normal cardiac sounds, S1 and S2, and no murmurs. The patient did not exhibit symptoms of cardiac decompensation or systemic vascular abnormalities, which may resemble other reasons for thrombotic events due to cardiac embolism. The patient presented with mild neurological deficits, primarily slurred speech, imbalance, and lower

limb weakness, which had a significant impact on his coordination and ambulation. On examination, Manual Muscle Testing (MMT) revealed moderate weakness in both lower limbs (3/5) and mild weakness in the upper limbs (4/5), along with hyperreflexia in all four limbs, suggesting central nervous system involvement. Sensory function remained intact.

Radiological examination, including MRI venography, showed partial thrombosis of the superior sagittal and right transverse sinuses with chronic ischaemic changes, confirming chronic Cerebral Venous Sinus Thrombosis (CVST). Chronic ischaemic changes in the left parietal lobe were consistent with prior cerebrovascular events. There was no acute infarction, intracranial haemorrhage, or mass lesions. The ventricles and brainstem were normal, with small vessel ischaemic changes in the periventricular white matter. Routine blood investigations were within normal ranges, including a Complete Blood Count (CBC). The patient's coagulation profile revealed an International Normalised Ratio (INR) of 2.5, indicating effective anticoagulation therapy. Lipid profile was within normal limits. Liver and kidney function tests were within normal limits, excluding systemic organ dysfunction as a causative factor. The ayurvedic examination also revealed a *Vata-Pitta*'s dominant pulse (*Nadi Pariksha*) and coated tongue (*Jivha*), indicating the presence of *Ama* (toxins) in the system. Hence, all the investigations together formed a proper perspective regarding the patient's systemic and neurological status, which influenced the integrative management of his chronic disorder depicted in [Table/Fig-1].

## Objective Examination (O/E)

The objective examination revealed that the patient's sensory pathways were intact, suggesting that the primary issue was motor-related rather than sensory. Muscle tone assessment showed slight deficits, particularly in the lower limbs, with the upper limbs graded at 4/5 for both sides (right and left) and the lower limbs at 2+ for both sides. These findings follow the standard grading scale (0–5). MMT

Investigation	Result	Normal range
Blood Pressure (BP)	130/80 mmHg	<120/80 mmHg (optimal)
Haemoglobin	Normal	Male: 13.8–17.2 g/dL
White Blood Cell Count	Normal	4,000–11,000 cells/ $\mu$ L
Platelet Count	Normal	150,000–450,000/ $\mu$ L
Prothrombin Time (PT)	Normal	10–13 s
International Normalised Ratio (INR)	2.5	2.0–3.0 (therapeutic range)
Total Cholesterol	171 mg/dL	160–200 mg/dL
HDL Cholesterol	46 mg/dL	35–75 mg/dL
LDL Cholesterol	107 mg/dL	50–165 mg/dL
Triglycerides	90 mg/dL	65–160 mg/dL
Liver Function Tests (LFTs)	Normal	ALT: <40 U/L, AST: <40 U/L
Kidney Function Tests (KFTs)	Normal	Creatinine: 0.7–1.3 mg/dL, Urea: 15–40 mg/dL
MRI Venography (Initial)	Partial thrombosis of superior sagittal and right transverse sinuses	No thrombosis or abnormal flow
MRI Venography (Follow-Up)	Partial recanalisation	No thrombosis or abnormal flow
Ayurvedic Nadi Pariksha	Vata-Pitta dominant	-
Jivha (Tongue Coating)	Coated	Clean

**[Table/Fig-1]:** Investigation results with normal range.

revealed moderate weakness in the lower limbs (right and left graded at 3/5) and mild weakness in the upper limbs (right and left graded at 4/5). Reflex testing showed hyperreflexia, with all reflexes (triceps jerk, supinator jerk, knee jerk, and ankle jerk) graded at 3 for both sides, indicating upper motor neuron involvement. The bilateral symmetry of the reflexes suggested a symmetrical neurological dysfunction.

### Functional Impairment

Despite the motor weakness, the patient could walk independently, indicating a preserved level of functional mobility and reduced dependency on assistance for ambulation.

The differential diagnoses considered included arterial ischaemic stroke, intracranial space-occupying lesions, multiple sclerosis, and idiopathic intracranial hypertension. These were systematically ruled out based on clinical presentation and radiological findings:

**Arterial stroke** was excluded due to the absence of sudden onset and localised deficits, along with MRI venography revealing dural sinus thrombosis rather than arterial occlusion.

**Intracranial space-occupying lesions** were ruled out as the MRI showed no mass effect or enhancing lesions.

**Multiple sclerosis** was excluded based on age, absence of demyelinating lesions, and lack of relapsing-remitting neurological symptoms.

**Idiopathic intracranial hypertension** was unlikely due to the absence of papilloedema and normal ventricular size.

Thus, the chronic and progressive nature of symptoms, radiological evidence of sinus thrombosis, and regular systemic evaluation confirmed the diagnosis of chronic CVST.

### Treatment Plan

The management plan included an integrative approach, combining Ayurveda with neuro-rehabilitation physiotherapy:

#### Ayurveda Management

Ayurveda is a holistic medical system that offers effective therapeutic interventions for neurological disorders such as CVST by balancing the doshas (biological energies) and restoring systemic harmony. A comprehensive Ayurvedic regimen balanced Vata and Pitta doshas, incorporating therapies like *Shiro Basti*, *Matra Basti*, and *Nasya Karma* to enhance cognitive function and relieve neurological

issues. Oral medications such as *Brihat Vata Chintamani Rasa* and *Ashwagandha Churna* targeted Vata imbalances, while dietary and lifestyle modifications emphasised a Pitta-Vata pacifying approach, as shown in [Table/Fig-2].

Treatment	Dosage/Procedure	Duration	Purpose
<i>Shiro Basti</i>	Brahmi Taila is applied to the scalp for 30–45 minutes daily.	15 days	It calms the nervous system and enhances cognitive recovery.
<i>Sarvanga Snehan</i> and <i>Sweden</i>	Full-body oleation and sudation using <i>Bala Ashwagandha Taila</i> .	15 days	It improves circulation, relaxes muscles, and pacifies Vata dosha.
<i>Matra Basti</i>	Rectal administration of <i>Brahmi Ghrita</i> and <i>Dhanwantram Taila</i> (60 ml).	Daily for 7 days; repeat after 2 weeks.	It pacifies Vata dosha improves digestion and nourishes the nervous system.
Nasya (Nasal Therapy)	<i>Bala Ashwagandha Taila</i> , four drops bilaterally twice daily.	15 days	It promotes clarity of mind and reduces neurological symptoms.
<i>Shiva Gutika</i>	1 tablet thrice daily (TDS) after meals.	3 months	Rejuvenates and strengthens the nervous system.
<i>Brihat Vata Chintamani Rasa</i>	2 grams twice daily (BD) after meals.	3 months	It addresses Vata disorders and strengthens the nervous system.
<i>Ashwagandha Churna</i>	3–5 grams, twice daily, with milk.	3 months	Reduces stress, improves strength, and enhances neurological recovery.
<i>Brahmi Ghrita</i>	5–10 ml, twice daily, with warm milk.	3 months	Enhances cognitive function and nerve recovery.
<i>Haritaki Churna</i>	5 grams, once daily at bedtime, with warm water.	1 month	It detoxifies the body and improves digestion.
<i>Ekanga Veera Rasa</i>	1 tablet, twice daily, with water.	3 months	Strengthens muscles and nerves, reducing neurological deficits.

**[Table/Fig-2]:** Ayurvedic Treatments with Dose and Duration

The recommended dietary path includes light, warm, and freshly cooked foods to balance aggravated Vata and Pitta doshas, as detailed in [Table/Fig-3]. Lifestyle recommendations emphasise stress management and regular physical activity to support neurological stability. Conversely, apathy includes avoiding spicy and fried foods, as they aggravate inflammation and cold or processed foods exacerbating Vata imbalances.

### Treatment Plan for Physiotherapy

The treatment plan was to treat the patient's motor deficits, balance disturbances, and coordination impairments caused by chronic CVST. A total of 20 supervised physiotherapy sessions were conducted over four weeks, each lasting approximately 45 minutes. Sessions were held five days per week, integrating evidence-based neuro-rehabilitation techniques. The programme was coordination exercises such as tandem walking and single-leg stance, with sets of 10 repetitions, twice daily, to regain balance and proprioception. Strengthening exercises of the lower limbs with body weight support were used to improve muscle tone and functional mobility [1]. Frank's exercises and marching were incorporated to promote coordination, endurance, and dynamic stability, and balance training included standing with closed eyes and open to test sensory-motor integration [1]. Light marching for two minutes added aerobic activity to improve cardiovascular endurance and physical stamina. This targeted, evidence-based rehabilitation plan, professionally supervised, not only supported the improvement of the impaired muscles but also boosted the confidence and ability of the patient to self-manage daily activities independently. Progress was monitored at assessment, which ensured the suitability of therapy to meet the evolving needs of the patient [2] [Table/Fig-4].

Pathya (Recommended)	Apathya (To Avoid)
<b>Dietary Recommendations</b>	
- Easily digestible, warm, and freshly cooked food.	- Spicy, fried, and processed foods.
- Light and nourishing meals such as rice, moong dal, and soups.	- Fermented foods like pickles and curd.
- Whole grains like wheat and barley.	- Excessively oily or heavy meals.
- Fresh fruits (e.g., pomegranate, apples) and vegetables (e.g., spinach, carrots).	- Carbonated drinks and excessive caffeine.
- Herbal teas like Tulsi and Brahmi infusions.	- Cold and refrigerated foods or drinks.
- Warm water for hydration.	- Alcohol and tobacco products.
<b>Lifestyle Recommendations</b>	
- Regular light physical activity, such as walking or yoga.	- Sedentary lifestyle or excessive exertion.
- Adequate sleep (7–8 hours) and stress management through meditation.	- Erratic sleep patterns or staying up late.
- Breathing exercises (Pranayama) to enhance oxygenation.	- Overuse of digital devices leads to eye strain.
- Maintaining a regular daily routine (Dinacharya).	- Excessive exposure to stress or emotional strain.

[Table/Fig-3]: Pathya and Apathya

Intervention	Repetitions × Sets	Purpose
Coordination Exercises	10 repetitions × 2 sets	To restore fine motor control and enhance neurological coordination
Tandem Walking	10 repetitions × 2 sets	To improve balance during gait and posture
Single Leg Stance	10 repetitions × 2 sets	To enhance proprioception and static balance
Standing with Eyes Closed and Open	10 repetitions × 2 sets	To challenge and improve equilibrium mechanisms and sensory-motor coordination
Franken's Exercises	10 repetitions × 2 sets	To improve coordination and limb strength
Marching	2 minutes	A dynamic movement exercise to build endurance and improve motor coordination
Strengthening Exercises for Lower Limbs	10 repetitions × 2 sets	To rebuild muscle strength and support functional mobility recovery

[Table/Fig-4]: Treatment plan

The physiotherapy treatment plan focuses on coordination, balance, strength, and functional mobility recovery through targeted exercises and repetitions patient's progress and treatment adjustments during 10 months was followed up [Table/Fig-5].

Followup imaging 10 months later, on 18/09/2023, showed partial recanalisation of the superior sagittal and right transverse sinuses,

Follow-up	Evaluation goals	Findings	Actions taken
1st Follow-Up (1 Week)	Assess initial response to integrative therapy	Headache reduced, improved sleep, slight gait improvement, no adverse effects	Continued existing regimen; minor adjustment in oral medication doses
2nd Follow-Up (15 Days)	Monitor neurological progress and therapy compliance	Better balance, mild speech improvement, reduced dizziness, adherence to Panchakarma and physiotherapy	Continued all therapies; increased physiotherapy intensity
3rd Follow-Up (1 Month)	Functional assessment; consider imaging if needed	Improved coordination and motor strength, speech normalised, increased daily activity independence	Continued current regimen; reinforced lifestyle and dietary advice

4th Follow-Up (3 Months)	Reassess symptoms; monitor for recurrence	Complete symptom resolution, enhanced muscle tone and gait, no new complaints	Maintained integrative plan; planned followup imaging
5th Follow-Up (10 Months)	Radiological reassessment (MRI venography on 18/09/2023)	Partial recanalisation of sinuses, no new infarcts or haemorrhage, improved venous drainage	Continued maintenance therapy; added <i>Rasayana</i> medications
Ongoing (Every 6 Months)	Ensure long-term neurological stability; prevent recurrence	No recurrence of CVST, sustained strength, balance, and speech improvement, INR stable at 2.5	Tapered intensive therapy gradually; advised annual MRI if needed

[Table/Fig-5]: Follow-up table documenting the patient's progress and treatment adjustments during 10 months.

with better venous drainage and no new infarcts. The absence of acute or progressive lesions reflected the effectiveness of the ongoing therapeutic interventions.

## DISCUSSION

Cerebral Venous Sinus Thrombosis (CVST) is a rare and complex neurological disorder characterized by the formation of thrombi in the cerebral venous sinuses, which causes impaired venous drainage and intracranial hypertension. Although conventional therapies prevent the propagation of thrombus, residual neurological deficits and functional impairments usually persist, especially in chronic cases. This case demonstrates the possibility of using a combination of Ayurvedic therapies and physiotherapy to help residual symptoms, restore neurological function, and improve overall recovery [3].

CVST disrupts the venous drainage of the brain, resulting in venous stasis, increased intracranial pressure, and venous infarction. In chronic cases, partial recanalisation and development of collateral circulation may alleviate some of the symptoms; however, longstanding ischaemic damage results in persistent deficits. Such deficits manifest in headaches, motor impairments, balance issues, and cognitive abilities dysfunction. Indeed, the patient complained of persistent headaches, slurring of speech, and unsteady gait, and therefore his quality of life had been badly affected. Imaging findings showing partial thrombosis of the superior sagittal and right transverse sinuses attested to its chronicity [4,5]. Ayurveda provides a holistic approach to managing chronic neurological disorders such as CVST, correcting systemic imbalances and promoting tissue regeneration. Based on the principles of Ayurveda, CVST can be conceived as an aggravated state of *Vata* and *Pitta* doshas. *Vata* controls movement, coordination, and the nervous system, while *Pitta* controls metabolism and transformation. Imbalances in these doshas result in impaired circulation, inflammation, and neurological dysfunction [6,7].

**Panchakarma Therapies: *Shiro Basti*:** The medicated oil applied to the scalp during this therapy is primarily meant to pacify aggravated *Vata* and *Pitta* doshas. The Brahmī Taila used herein has neuroprotective, nootropic, and sedative actions, stimulating cognition and relieving stress. Transdermal absorption during *Shiro Basti* increases blood supply to the brain and enhances neurofunction, especially in cerebrovascular conditions such as CVST [8]. ***Matra Basti*:** Medicated oils like Brahmī Ghrita and *Dhanwantram Taila* are given through the rectum to balance *Vata* dosha and to nourish the nervous system. This therapy not only enhances digestion and detoxification but also increases the systemic absorption of nutrients, thus helping the body's recovery as a whole [9]. **Nasya:** The nasal administration of *Bala Ashwagandha Taila* works in the brain directly through the nasal-brain axis—a pathway increasingly acknowledged today. This therapy clarifies thoughts, diminishes neurology symptoms, and localizes relief from *Vata* imbalances [10].

The medications used in Ayurvedic management include *Brihat Vata Chintamani Rasa* and *Shiva Gutika*. *Brihat Vata Chintamani Rasa* is neurotoxic, thus helping degenerate nerves and reducing stress. *Shiva Gutika* is an adaptogen and rejuvenator, supporting the recovery of cognition and motor function. *Ashwagandha Churna* is an adaptogen that reduces oxidative stress and promotes nerve regeneration, whereas *Brahmī Ghrita* enhances cognitive function and supports memory [11]. Pathya (Diet and Regimen): A *Pitta-Vata* pacifying diet was emphasised, which included light, easily digestible foods such as rice, moong dal, and cooked vegetables. The patient was advised to avoid foods that enhance inflammation and *Vata* dosha, such as spicy, fried, and fermented items. Stress management through meditation and Pranayama (breathing exercises) was included in the regimen to reduce *Vata*-related anxiety and promote mental stability [12].

Physiotherapy was an essential part of treating motor deficits, impairments of balance, and functional disability. Neurological rehabilitation focuses on the improvement of strength in muscles, proprioception, and coordination through various specific exercises [13]. Activities such as tandem walking, single-leg standing, and standing with eyes closed and open helped restore proprioceptive feedback and equilibrium. These interventions rewired the vestibular apparatus and enhanced dynamic balance; thus, the fall risk was minimised [14]. Strengthening Exercise Resistance-based exercises focused on lower limbs, particularly the quadriceps and hamstrings, to restore functional mobility. Core-strengthening exercises, including planks and bridges, enhanced stability and posture during locomotion [15]. Gait Training: Parallel bars and body weight support enabled the patient to practice various walking patterns to strengthen the coordination of steps and decrease compensatory movements. Tandem walking exercises further helped to enhance the stability of gait and motor control [16]. Endurance and Flexibility: Light cycling and controlled treadmill walking were done to improve cardiovascular fitness and build physical stamina. Stretching exercises for the calf, quadriceps, and hamstrings prevented muscle stiffness and maintained flexibility [17]. Motor re-education: Fine motor activities like finger-to-nose tests and object handling helped retrain hand-eye coordination and dexterity. These activities were critical in regaining precision in daily tasks. The physiotherapy plan was performed under professional supervision, and exercises were tailored to the patient's evolving needs. Progress was monitored through periodic evaluations, which ensured continuous improvement [18]. The patient was then put on Ayurvedic therapies and physiotherapy, which showed dramatic clinical improvement. Neurological symptoms such as slurred speech and difficulty in balance were resolved, and the patient became independent with activities of daily living. At this point, followup MRI venography showed partial recanalization of the thrombosed sinuses, which correlated with clinical recovery. Physiotherapy helped restore motor function and confidence, while Ayurvedic therapies addressed systemic imbalances and supported neuroregeneration.

This case highlights the need for a multidisciplinary approach to manage chronic CVST. Ayurveda provides unique interventions that complement physiotherapy by addressing systemic and neurological imbalances. Therapies such as *Shiro Basti* and *Matra Basti*, supported by herbal formulations, provide neuroprotective and rejuvenating effects that modern medicine may not achieve alone. Physiotherapy enhances physical recovery and bridges the

gap between structural recovery and functional independence. More studies are still needed to justify the role of Ayurveda in treating chronic CVST. Using Randomised Controlled Trials (RCTs) serves as more robust evidence to establish effectiveness and safety. Standardising interventions within Ayurvedic therapy and introducing these treatments in pathways followed during conventional treatment might improve recovery outcomes among chronic neurological patients.

The patient has achieved functional independence in daily activities and no longer requires medication for neurological symptoms. However, antihypertensives and dietary/lifestyle modifications are being continued for systemic support and secondary prevention.

## CONCLUSION(S)

This case highlights the integration of Ayurveda and physiotherapy for chronic CVST, thereby making a holistic model useful in achieving considerable recovery in managing this disease, underlying the value of multidisciplinary care for complex cerebrovascular disorders. This model can further be a basis for more research on integrative therapies in chronic neurological conditions.

## REFERENCES

- [1] Travis FT, Wallace RK. Doshā brain-types: A neural model of individual differences. *J Ayurveda Integr Med.* 2015 Oct-Dec;6(4):280–85.
- [2] WHO benchmarks for the practice of Ayurveda. Geneva: World Health Organization; 2022. Available from: <https://www.who.int/publications/item/9789240042674>
- [3] Pandey GS, editor. Bhavaprakash Nighantu of Bhavamisra, Vatadi Varga. 5th ed. Varanasi: Chaukambha Bharati Academy; 2015. p. 511.
- [4] Dwivedi S. Terminalia Arjuna Wight & Arn. - a useful drug for cardiovascular disorders. *J Ethnopharmacol.* 2007 Nov 1;114(2):114–29.
- [5] Yang W, Zilov A, Soewondo P, Bech OM, Sekkal F, Home PD. Observational studies: Going beyond the boundaries of randomized controlled trials. *Diabetes Res Clin Pract.* 2010;88 Suppl 1:S3-S9.
- [6] Li Y, Zhang M, Xue M, Wei M, He J, Dong C. A case report of cerebral venous sinus thrombosis presenting with rapidly progressive dementia. *Front Med.* 2022;9.
- [7] Allroggen H, Abbott RJ. Cerebral venous sinus thrombosis. *Postgrad Med J.* 2000 Jan;76(891):12–5.
- [8] Wang Y, Meng R, Duan J, Liu G, Chen J, Li S, Ji X. Nephrotic syndrome may be one of the important etiologies of cerebral venous sinus thrombosis. *J Stroke Cerebrovasc Dis.* 2016 Oct 1;25(10):2415–22.
- [9] Amoozegar F, Ronksley PE, Sauve R, Menon BK. Hormonal contraceptives and cerebral venous thrombosis risk: A systematic review and meta-analysis. *Front Neurol.* 2015;7.
- [10] Sharma V, Samal S, Morgade S, Kovela RK, Dagal R, Thimoty R. Efficacy of physiotherapy rehabilitation for hemiparesis following cerebral venous sinus thrombosis: A rare case report. *J Pharm Res Int.* 2022;34(1A):43–47.
- [11] Paul M. Effectiveness of PNF of respiration to improve the exercise capacity in patients with COPD: A pilot study. *Medicine.* 2017;6.
- [12] Van Crieckinge T, Truijien S, Schröder J, Maebe Z, Blanckaert K, van der Waal C, et al. The effectiveness of trunk training on trunk control, sitting and standing balance and mobility post-stroke: A systematic review and meta-analysis. *Clin Rehabil.* 2019 Jun;33(6):992–1002.
- [13] Mozaffarian D, Wilson P, Kannel W. Beyond established and novel risk factors: Lifestyle risk factors for cardiovascular disease. *Circulation.* 2008;117:3031–38.
- [14] Writing Group Members. Heart disease and stroke statistics—2006 update: A report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation.* 2006;113(6):e85–e151.
- [15] Nag T, Ghosh A. Cardiovascular disease risk factors in Asian Indian population: A systematic review. *J Cardiovasc Dis Res.* 2013;4(4):222–8.
- [16] Ekor M. The growing use of herbal medicines: Issues relating to adverse reactions and challenges in monitoring safety. *Front Pharmacol.* 2014;4:177.
- [17] Rahman HS, Othman HH, Hammadi NI, Yeap SK, Amin KM, Abdul Samad N, et al. Novel drug delivery systems for loading of natural plant extracts and their biomedical applications. *Int J Nanomedicine.* 2020 Apr 15;15:2439–83.
- [18] Greenwell M, Rahman PK. Medicinal plants: Their use in anticancer treatment. *Int J Pharm Sci Res.* 2015;6(10):4103–12.

**PARTICULARS OF CONTRIBUTORS:**

1. Postgraduate Student, Department of Kayachikitsa, Mahatma Gandhi Ayurved College, Hospital and Research Centre, Wardha, Maharashtra, India.
2. Professor, Department of Kayachikitsa, Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod, Wardha, Maharashtra, India.
3. Assistant Professor, Department of Kayachikitsa, Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod, Wardha, Maharashtra, India.
4. Postgraduate Student, Department of Kayachikitsa, Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod, Wardha, Maharashtra, India.

**NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:**

Dr. Mohnish V Gokhale,  
Mahatma Gandhi Ayurved College, Hospital and Research Centre Salod (Hirapur),  
Wardha-442001, Maharashtra, India.  
E-mail: mohnishgokhale76@gmail.com

**PLAGIARISM CHECKING METHODS:** [Jain H et al.]

- Plagiarism X-checker: Jan 08, 2025
- Manual Googling: Oct 28, 2025
- iThenticate Software: Oct 30, 2025 (2%)

**ETYMOLOGY:** Author Origin**EMENDATIONS:** 6**AUTHOR DECLARATION:**

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Jan 07, 2025**  
Date of Peer Review: **May 30, 2025**  
Date of Acceptance: **Nov 1, 2025**  
Date of Publishing: **Apr 01, 2026**