

REVIEW ARTICLE

A critical Review of *Patrapinda SWEDA* in the Management of Cerebral Palsy

Author: Kurre Pallavi¹

Co Authors: Chandravanshi Lowkesh², Rathia Satyawati³, Kadam Vitthal Kerdas⁴ and Nayak Renuka⁵

¹⁻⁵Dept. of Kaumarabhritya, Shri Narayan Prasad Awasthi Govt. Ayurveda College Raipur, C.G., India

ABSTRACT

Introduction: Cerebral Palsy is paralysis caused due to brain injury that can affect muscle tone, posture, strength, vision, hearing, and both physical and mental development in children. The same type of symptoms also seen in various *Avaranajanya vatavyadhi*, so we can co-relate Cerebral Palsy with *Avaranajanya vatavyadhi*. *Patrapinda sweda* is very effective in vitiated *vata* dosha. Hence it can be used in *Avaranajanya vatavyadhi* and ultimately in Cerebral Palsy.

Material and methods: Ayurvedic Samhitas, text books and commentaries have undergone extensive review. To review the subject, a number of clinical studies on *Patrapinda sweda* and Cerebral Palsy that have been published in Ayurvedic journals and made accessible online have also been cited

Discussion: The main property of *swedana* is to pacify *Vata dosha*. Hence, it can be effective in *Avaranajanya vatavyadhi*. The *ushna guna* of *swedana* is opposite to *sheeta guna* of *vata*. Also, due to its properties, *swedana* helps to relieve *stambhana* and *gaurava* i.e. stiffness and heaviness. *Ushna* and *Tikshna guna* of *Swedana* also enhance vasodilation and thereby circulation which ultimately result in proper circulation in body parts and improvement in conditions affected due to abnormal circulation.

Conclusion: Hence according both Ayurveda and modern science, *Patra Pinda Sweda* show muscle relaxant, nerve-stimulating, and analgesic properties that aid in enhancing the condition of Cerebral Palsy.

Key Words Cerebral Palsy, *Patrapinda Swedana*, *Agni Sweda*, *Stambha*

Received 21st November 2025 Accepted 04th January Published 10th January 2025

INTRODUCTION

Children with disabilities are a significant worry for both families and society. When it comes to discussing disability, especially in children, around 25% of persistent childhood issues stem from neurological causes. Cerebral Palsy (CP) is a, permanent, nonprogressive, occasionally evolving disorders of movement, tone, and posture, caused by prenatal natal and postnatal causes they all cause damage the developing

brain. The motor disorders of CP are often accompanied by disturbance of sensation, cognition, communication and behaviour by epilepsy and secondary musculoskeletal problem. It is a group of symptoms not a single disease (CP) is the leading cause of chronic disability in children, making them physically and mentally handicapped and socially detached. The worldwide incidence of CP is approximately 2-3 cases per 1000 live births¹.

REVIEW ARTICLE

In Ayurveda, Cerebral Palsy is associated with *Avaranjanya Vatavyadhi* because *Vata dosha* is considered the primary dosha responsible for all types of movement (*gati*), normal functioning of sensory organs such as speech, vision, and hearing, and the normal functioning of *dhatu* and physiological processes like intellect power, bowel movements, defecation and tears etc. Any cause, that results in *Vata dushti*, leading to the disruption of their normal function and resulting in various clinical symptoms such as pain, muscle spasticity, movement restriction, impaired hearing and vision, as well as mental and physical retardation.

Swedana therapy in Ayurveda is best known to relieve *Stambhana* and *Gaurava* i.e. stiffness and heaviness respectively. *Swedana* after *snehana* regulates the *Mala* (stool), *mutra* (urine) and *reta* (semen). It is very useful in most of the *Vata vikaras* like *Aavrutta vata*, *Manyashool*, *Ardita*, *Pakshaghata*, *Grudhrasi*, *Parshva-prushta-kati graha*, *Vatakantak*, *Sankocha*, *Aayama*, *Shoola*, *Stambha*, *Gaurava*, *Supt* as described by Acharya Charaka in 13th chapter of *sutrasthana*.

Many of these symptoms are seen in Cerebral Palsy. *Patrapinda sweda* is a type of *swedana* which can be used in all the diseases and symptoms described above. Most of these symptoms are due to *Vata*. Hence, treating *Vata* with *Patrapinda sweda* can be a good strategy to fight against *Vatavyadhi*.

MATERIAL AND METHODS

There is no direct co-relation of CP found in Ayurveda but we found some similarities in symptoms of Cerebral Palsy and *Aavrutta vata* and most of *Vata vyadhis*. Hence, we have indirectly related CP with *Aavrutta vatavyadhi* and collected data related to it from *Ayurvedic Samhitas*, Textbooks and Commentaries. Also, some online articles from journals are used as reference and cited.

Causes of Cerebral Palsy

Acharya Sushrut mentioned that the causes of prenatal issues which affect the *Garbha* are inappropriate *Ritu* (incorrect conceptional period), *Kshetra* (uterus), *Ambu* (amniotic fluid), *Beeja* (ova and sperm)², improper *garbini paricharya* (improper antenatal care), *Duahrida Awmana* (disregarding the requirements of an expecting mother)³ and *Garbhupghatkara bhava* (Harmful factors for developing fetus)⁴, *Purvajanamkrita ashubha karma* (improper deeds of past life), *Garbhashaya vikriti* (Abnormalities of uterus and reproductive system), *Apathya ahar vihar* (improper diet and regimen)⁵. These causes lead to undesirable effects on the foetus in utero.

Natal cause like forceful delivery during childbirth, known as "*Akala Pravahan*," can result in conditions such as *Muka*, *Badhira*, *Kubja*, *Vyasthanu*, *Murdha-abhighat*, *Kasa*, *Swasha*, *Shosh* in child⁶. Acharya Kashyap mentioned postnatal causes such as *Grahabadha*, *Jataharini*, *Kshiraja*, *Garbhaja*, and *Vyadhija*

REVIEW ARTICLE

*Phakka roga*⁷ which impact the ability to stand and walk. These factors affect the growth, development, and overall health of the baby, potentially leading to disease, deformities, and even death.

Genetics and issues related to pregnancy are believed to be the contributors to Cerebral Palsy. Various conditions during pregnancy, including infections, maternal health problems, factors that disrupt the foetus's brain development, and complications during labor and delivery, can lead to Cerebral Palsy. The likelihood of developing Cerebral Palsy is higher in preterm and low birth weight newborn (1500gm). Additionally, Cerebral Palsy may arise from accidents, bacterial meningitis, malnutrition, or toxins that result in brain damage. The causes of Cerebral Palsy are explained in figure no. 01.

Pathophysiology of CP

Understanding the pathophysiology of CP is crucial as it is considered to be the result of a remarkable series of events that affects the brain during early stage of brain development. The severity of the disease in the patient is determined by the region of the brain that is impacted. Hypoxic ischemic encephalopathy destroys tissue in the cerebral motor cortex and other areas of the brain. Some fatal strokes can result in intracranial haemorrhage and damage in brain. Abnormal development of the brain (cerebral dysgenesis) due to any interruption of the normal process of brain growth during fetal development can cause brain malformations that interfere with the transmission of brain signals.

The white matter of the brain is responsible for transmitting signals inside the brain and to the rest of the body. Periventricular leukomalacia describes a type of damage that looks like tiny holes in the white matter of an infant's brain. These gaps in brain tissue interfere with the normal transmission of signals.

Types of Cerebral Palsy: according to affected area of brain¹

1. Spastic: Cerebral cortex
 - 1) Diplegia
 - 2) Monoplegia
 - 3) Hemiplegia
 - 4) Quadriplegia
2. Dyskinetic (Extrapyramidal): Basal ganglia or thalamus
3. Ataxic: Cerebellar malformation
4. Mixed: (spastic and dyskinetic)

Management of Cerebral Palsy:

Management of CP is multifactorial and multidimensional. The baby's condition improves by using physiotherapy, behavioural therapy, Speech therapy, occupational therapy in conventional method of treatment.

In Ayurveda, management of Cerebral Palsy is planned keenly with both *shaman* and *shodhan*. In *Shaman* therapy, herbal and herbo-mineral preparation are used to enhance the brain function, skeletomuscular and nervous functions. Medicines like *Brahmi vati*, *Saraswatarist*, *Saraswat churna*, *Kumarakalyan rasa*, *Aravindasava*, *Gorochanadi Gulika*, *Aswagandha churna*, *Shatavari churna* are used in clinical practice. In *Shodhana* therapy,
January 10th 2025 Volume 22, Issue 1 Page 58

REVIEW ARTICLE

panchakarma i.e *Basti, Nasya, Shirodhara, Shiropichu, Shiroabhayanga*, is done with *Poorvakarma* like *snehana* and *swedana*. Condition of *dosha, dushya, roga bala*, and *dehabala* of a patient is taken into account before planning of these procedures.

Panchakarma Procedure has mentioned 3 stages

- *Purvakarma: Deepan - Pachan, Snehan, Swedan,*
- *Pradhankarma: Vaman, Virechana, Basti, Shirovirechana, Raktamokshan*
- *Pashchatkarma: Sansarjan karm, Shamana, Rasayan.*

Swedanakarma for the purpose of *shodhana karma* (Purification) is a *poorvakarma* action after *Snehan karma*, but when the treatment through *Swedana* is done for the relief of disease then it is the *Pradhankarma* (main action).

β LrEHkxkSjo'khr?ua Losnua Losndkjde~ β

Swedana provides relief from the stiffness (*Stambha*), heaviness (*Gaurav*), and cold

(*Shitghna*) in the body ⁸ It is used to treat *Vata kapha vyadhi*. Acharya Charak described two types of *Sweda* viz. *Sagni* and *Niragni sweda* ⁹. In Ayurveda, *Swedana* procedures are performed using *Pind Sweda*, which involves the use of *Kizhi/Pinda/Pottali* (bolus) containing drugs for *Ekanga* and *Sarwanga Sweda*. *Patra pinda* made of two-word *patra* means leaves and *pinda* means bundles. *Patra pinda sweda* refers to the *Swedana* performed using a bundle of *Vata - Kaphahara patra*. This is a critical review of the *Patra pinda Swedana (panchkarma)* procedure in management of Cerebral Palsy. It falls under the category of *Snigdha Sankara Sweda*, which is classified as *Sagni Sweda* ⁹.

Preparation of Patra pinda sweda: Ingredient of *Patra pinda sweda* ¹⁰

Drugs used in Patrapinda sweda: The drugs which can be used to make pottali of patrapinda sweda are described in table number 01.

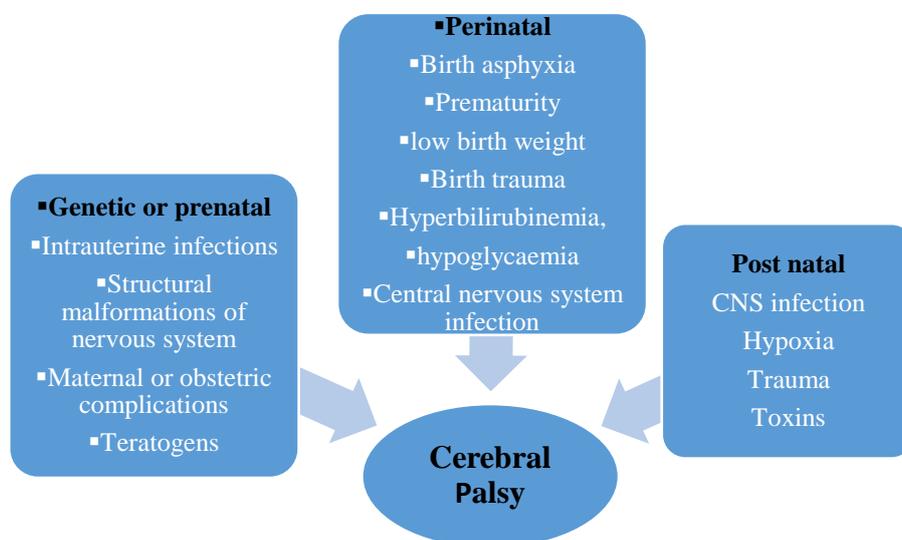


Figure 1 Causes of Cerebral Palsy

REVIEW ARTICLE

Table 1 Dravyas used in *Patrapinda sweda*

S.N.	Plant	Rasa	Guna	Virya	Vipaka	Pharmacological activity	Quantity
1.	Eranda patra ¹¹ Botanical name: <i>Ricinus communis</i> Family: <i>Euphorbiaceae</i>	Madhur, Anurasa- Katu, Kashaya	Snighdha, Tikshna, Sukshma Kapha-Vata shamaka	Ushna	Madhura	Analgesic, CNS stimulant, non-anxiogenic, Memory enhancing properties	50 gm
2.	Shigru patra ¹² Botanical name: <i>Moringa oleifera</i> Family: <i>Moringaceae</i>	Katu, Tikta	Laghu, Ruksha, Tikshna Kapha-Vata shamaka	Ushna	Katu	Anti-inflammatory, Anti-cancer, Anti-diabetic	50 gm
3.	Arka patra ¹³ Botanical name: <i>Calotropis procera</i> Family: <i>Asclepiadaceae</i>	Katu, Tikta	Laghu, Ruksha, Tikshna Kapha-Vata shamaka	Ushna	Katu	anti-inflammatory, antioxidant, analgesic, antinociceptive properties	50 gm
4.	Chincha patra ¹⁴ Botanical name: <i>Tamarindus indica</i> Family: <i>Fabaceae</i>	Amla	Guru, Ruksha Kapha-Vata shamaka	Ushna		antibacterial, antihyperlipidemic, antiulcer, anticancer, antifungal, wound healing, hepatoprotective, and immunomodulatory effects	50 gm
5.	Nirgundi patra ¹⁵ Botanical name: <i>Vitex nigundo</i> Family: <i>Labiatae</i>	Katu, Tikta	Laghu, Ruksha Kapha-Vata shamaka	Ushna	Katu	anxiolytic, anti-inflammatory, anti-oxidant, anti-bacterial, hepatoprotective	50 gm
6.	Dhatra patra ¹⁶ Botanical name: <i>Datura metel</i> Family: <i>Solanaceae</i>	Tikta, Katu	Laghu, Ruksha, Vyavi, Vikasi, Kapha-Vata shamaka	Ushna	Katu	Analgesic anti-inflammatory	50 gm
7.	Nimbu ¹⁷ Botanical name: <i>Citrus lemon</i> Family: <i>Rutaceae</i>	Amla	Guru, Tikshna Kapha-Vata shamaka	Ushna	Amla	antioxidant properties, Stimulate muscle function	50 gm
8.	Tila taila ¹⁸ Botanical name: <i>Sesamum indicum</i> Family: <i>Pedaliaceae</i>	Guru, Snighdha	Madhura, Anuras- Kashya-Tikta Tridosh Shamaka	Ushna	Madhura	antioxidant, antibacterial, cardio tonic, antidiabetic, antiulcer, anti-inflammatory analgesic	100 ml
9.	Saindhav lavan ¹⁹ Rock salt, Chloride of Sodium	Snigdha, laghu	Madhura Tridosh Shamaka	Sheeta			10 gm

The medicinal plant leaf is cut into small pieces. *Tila taila* is placed in a pan and heated. The chopped leaf is then fried in *tila taila*. *Saindhav lavan* and chopped citrus fruit are mixed in and

properly cooked. Finally, a *pottali* is made by tying the mixture into a bolus using cotton cloth.

Method of Administration

Purvakarma (Pre procedure)

REVIEW ARTICLE

1. Preparation of patient: Assess patient for any contraindication. Examine his *Bala*, *Prakriti*, *Satmya*, *Sattva* and vitals.
2. Taken Patient signature in Consent form
3. Instruments: *Abhyanga table*, Oil, Pan, 18 × 18 inch 4 pieces of cotton cloth.
4. *Abhaynga (Snehan)* for 15 to 35 minutes on the affected part of the body or the entire body using *Vatashamaka* oil such as *Bala taila*, *Chandanbalalakshadi taila*, and *Dhanwantar taila* etc.
5. Preparation of *pottali*: *Pottali* is made ready using leaves and oil mentioned above.

Pradhankarma (Procedure):

Dip the *pottali* in hot oil in a pan, then apply gentle pressure while rubbing the affected body part. Perform *Patra pinda sweda* in 7 postures (Sitting, supine, left lateral, prone, right lateral, supine, sitting). Each posture should be maintained for 5 - 7 minutes during the procedure, resulting in a total duration of 30 - 40 minutes. While doing *swedana karma*, keep in mind that the *pottali* should be as hot as the patient can tolerate, otherwise there is a risk of the patient skin getting burnt, the temperature of the *pottali* should remain the same throughout the entire process, that is, it should neither be cold nor too hot.

Pashchatkarma (Post procedure):

After finishing this process, apply *Rasanadi churna* to the patient's head, focusing on the vertex region. The patient should rest for one hour, followed by a bath in lukewarm water. The

patient should consume light meals and hot water.

Precautions: The therapist must check the temperature of the *Pottali* by placing it on their skin. The optimal times to carry out the procedure are from 7 to 11 am and from 3 to 6 pm.

Complications: Burns, dehydration, fainting.

DISCUSSION

The local application of *Vatashamaka taila* during *Abhyanga* and *Patrapinda sweda* helps improve body circulation, reduce pain, and alleviate spasticity while enhancing muscle tone. The *ushna* and *snigdha* properties of the oil aid in providing body *snehana*, *kledana*, and *vishyandana* at a cellular level, nourishing body tissues and promoting the flexibility and mobility of soft tissues. Although the exact mechanism is not fully understood, *Abhayanga* has been observed to alleviate symptoms of Cerebral Palsy.

Probable mode of action of Patra Pinda Sweda in Cerebral Palsy

Symptoms of Cerebral Palsy include muscle stiffness, hypertonia, impaired vision, hearing issues, intellectual disability, dribbling or drooling of saliva, and growth retardation etc.

In Ayurveda, the symptoms of Cerebral Palsy are primarily attributed to *Aavaranajanya vata dosha*. The presence of *Aavaranajanya vata dosha* is linked to sensations such as pain, impaired hearing, visual issues, muscle tone

REVIEW ARTICLE

stiffness, and limited mobility. Initially, *Udvartana* may assist in diminishing the aggravated *Kapha* due to its *Ruksha* and *Srotoshodhana* and *Amapachan* properties. After the *Avarana* is addressed, the focus of treatment shifts to soothing the disturbed *Vata*.

The effects of *Swedana karma* (fomentation) on the body include *Stambhaghna*, *Gauravaghna*, and *Shitaghna*, as they relieve stiffness and heaviness by inducing sweating. The *Shitaghna* effect is due to their *Ushna* quality, while *Swedana karma* promotes sweating, aiding in the removal of impurities from the body. *Swedana* works through its characteristics like *Ushna* and *Tikshna*, which enhance the metabolic rate. The *Ushna Guna* of *Sweda* causes the dilation of capillaries (vasodilatation), leading to improved circulation. This process facilitates the elimination of waste products and enhances the absorption of *Sneha* or medicines through the skin.

In *Patrapinda Sweda*, *Vata-Kaphahara* medicines are utilized, and upon absorption, they exert their effects alongside *Swedana*. Additionally, it stimulates muscles and nerves, fostering their regeneration and providing a hypno-analgesic effect by redirecting stimuli²⁰.

A. Abhaynag and Swedana Procedure Effect: *Vayu* is associated with *Sparshnendriya*, which is present in *Tvachya*, and *Abhyanga* is recognized as being linked to *Tvachya*. Consequently, the combination of *Abhyanga* and *Patrapinda Sweda* can effectively target *Vata* to return it to a state of balance. The *Abhyanga* procedure generates heat

that stimulates blood and lymph circulation, helps eliminate toxins, enhances the quality of tissues, and alleviates stiffness. The application of medicated oil is absorbed by the body, providing nourishment to nerves and tissues while improving their strength.

B. Thermal mechanism Effect: Elevated temperatures enhance the diffusion of the drug and improve its absorption, as heat boosts the permeability of blood vessels and increases blood circulation.

C. Drug effect: According to Acharya Charaka, the ingredient in *Patrapinda sweda* is *Swedopaga Mahakashaya*. This ingredient possesses *Ushna Veerya* and *Snighdha Sukshma qualities*, along with *Kapha-Vatahara* properties. Consequently, all the attributes of this formulation help pacify the *Avaranajanya Vata dosha*.

This mechanism of action of *Patrapinda sweda* through drug effect, thermal mechanism and *swedana* is explained in figure no.02.

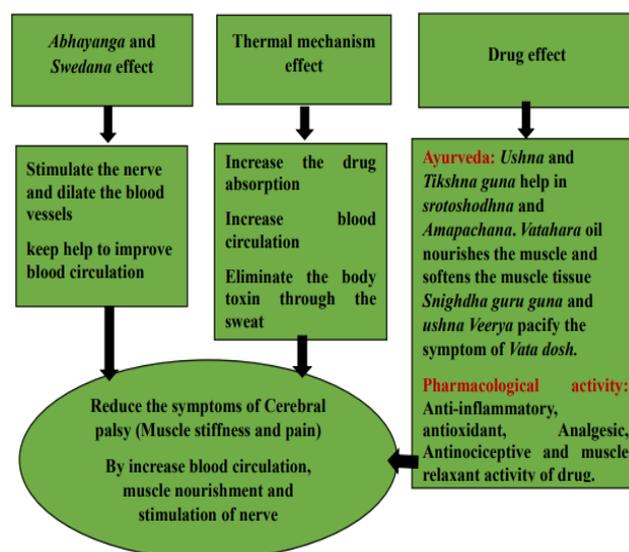


Figure 2 Mechanism of *Patrapinda Sweda*

REVIEW ARTICLE

The leaves used in this particular type of *swedana* are chosen according to their phytochemical and physicochemical properties.

R. communis (*Erand patra*) contains the alkaloid ricinine, which is associated with significant central analgesic effects based on various studies; it also serves as a stimulant for the central nervous system and demonstrates memory-enhancing properties. Ricinine does not inhibit exploratory behaviour in the brain, making it a non-anxiogenic substance²¹⁻²².

Moringa oleifera (*Shigru patra*), belonging to the *moringaceae* family, is abundant in various bioactive compounds, including flavonoids. It exhibits numerous pharmacological effects such as anti-inflammatory, anti-cancer, and anti-diabetic properties. The wide range of biological activities and disease-fighting capabilities of *moringa* is primarily attributed to the presence of polyphenols, carotenoids, alkaloids, terpenoids, and sulphur-containing compounds. Research has indicated that *moringa* leaves can inhibit cytokine production (TNF- α , IL-6, and IL-8) in human macrophages, resulting in reduced gene expression and inflammatory marker production in a RAW macrophage cell system (Waterman et al., 2014)²³.

Calotropis procera (*Arka patra*) has anti-inflammatory, antioxidant, analgesic and antinociceptive properties²⁴.

Datura metel (*Dhatura patra*): The phytochemicals found in *Datura* species are recognized for their analgesic and anti-inflammatory effects because they can inhibit the

generation of chemical mediators that activate nociceptors and trigger pain or inflammation²⁵⁻²⁶.

Vitex negundo (*Nirgundi patra*): *Nirgundi* is good *Vata* pacifying drug. It relieves local *stambhana* and *gaurava*. It shows anxiolytic, anti-inflammatory, anti-oxidant, hepatoprotective, anti-bacterial²⁷.

Tamarindus indica L. (*Chincha patra*) is a commonly utilized herbal plant. The leaves of this plant are known to possess medicinal properties, such as antibacterial, antihyperlipidemic, antiulcer, anticancer, antifungal, wound healing, hepatoprotective, and immunomodulatory effects. They are rich in orientin, iso-orientin, vitexin, iso-vitexin, glycosides, peroxidase, vitamin B3, and vitamin C. The antioxidant properties of the leaves have been extensively researched²⁸.

Citrus lemon (*Nimbu*) The juice of *Citrus limon* is rich in flavonoids, which are recognized for their potent antioxidant properties, helping to protect and improve cellular health by inhibiting the effects of free radicals, allowing cells to flourish and thrive without disruption. It also contains tannins, saponins, and alkaloids that aid in stimulating muscle function, supporting connective tissue, and organizing the internal structure of organs²⁹.

Sesamum indicum (*Tila taila*) contain many important phytochemical and minerals like sesamin, sesaminol, lecithin, cephalin, flavonoids, tannins, phenolic acids, saponins, terpenoids, iron, calcium, magnesium and. pharmacological activities of this compounds are-

REVIEW ARTICLE

antioxidant, antidiabetic, antibacterial, antiulcer, anti-inflammatory and analgesic³⁰.

According to modern science, ingredient of *Patrapinda sweda* possess anti-inflammatory, muscle-relaxing, and pain-relieving characteristics, which alleviate muscle stiffness and discomfort while promoting relaxation. Additionally, it nourishes the muscles and enhances mobility.

CONCLUSION

Cerebral Palsy is a condition that cannot be cured; however, Ayurveda can help improve the quality of life for children with Cerebral Palsy, potentially leading to greater longevity. *Patrapinda Swedana* may enhance blood circulation throughout the body, strengthen muscles in the affected areas, assist in the elimination of toxins, and reduce inflammation, pain and joint deformities, thereby preventing contractures and relief muscle stiffens, increased muscle strength, and proper nourishment of the *dhatu*s.

REVIEW ARTICLE

REFERENCES

1. Vinod K. Paul and Arvind Bagga (2019) Ghai Essential Pediatrics, 9th edition, CBS Publishers and Distribution Pvt. Ltd, p. 564-565.
2. Shastri, K. A. (Ed.). (2018). Sushrut Samhita: Ayurveda tatva Sandipika (Vol. 1, Sharirsthan, Sukrashonita Shuddhi Sharira, Chapter 2/35). Chaukhamba Sanskrit Sansthan.
3. Shastri, K. A. (Ed.). (2018). Maharshi Sushrut, Sushrut Samhita, Ayurveda tatva Sandipika Hindi commentary (Vol. 1, Sharir Sthan, Garbhavkranti Sharira, Chapter 3/15), p. 31). Chaukhamba Sanskrit Sansthan. (Reprint edition)
4. Shukla, V. (Ed.), & Tripathi, R. D. (Ed.). (2011). *Charaka samhita of Agnivesha elaborated by Charak and redacted by Dridabala with Vaidyamanorama Hindi commentary* (Vol. 1, Sharirsasthana 4/15). Chaukhamba Sanskrit Pratishthan.
5. Shukla, V. (Ed.), & Tripathi, R. D. (Ed.). (2011). Charaka samhita of Agnivesha elaborated by Charak and redacted by Dridabala with Vaidyamanorama Hindi commentary (Vol. 1, Sharirsasthana 2/29-30, p. 709). Chaukhamba Sanskrit Pratishthan.
6. Shastri, K. A. (Ed.). (2012). Sushrut Samhita: Ayurveda tatva Sandipika (Vol. 1, Sharirsthan, Garbhini Vyakran Sharira, Chapter 10/11, p. 101). Chaukhamba Sanskrit Sansthan.
7. Sharma, H. (Ed.), & Bhisagacharya, S. (Commentator). (2022). The Kashyapa Samhita or Vriddhajivakiya Tantra by Vriddhajivaka, revised by Vatsya, with Sanskrit introduction by Nepala Rajaguru Pandit Hemaraja Sharma, and the Vidyotini Hindi commentary by Ayurvedalankara Sri Satyapala Bhisagacharya (Vimansthana, Phakka Chikitsa Adhyaya, p. 208). Chaukhamba Sanskrit Sansthan.
8. Shukla, V. (Ed.), & Tripathi, R. D. (Ed.). (2011). Charaka samhita of Agnivesha elaborated by Charak and redacted by Dridabala with Vaidyamanorama Hindi commentary (Vol. 1, Sutrasthana 22/11, p. 309). Chaukhamba Sanskrit Pratishthan.
9. Shukla, V. (Ed.), & Tripathi, R. D. (Ed.). (2011). Charaka samhita of Agnivesha elaborated by Charak and redacted by Dridabala with Vaidyamanorama Hindi commentary (Vol. 1, Sutrasthana 14/40, p. 221). Chaukhamba Sanskrit Pratishthan..
10. Anup Jain, A Textbook of Panchakarma, Jaypee Brothers Medical Publishers, second edition 2019, page no 151.
11. Sharma, P. (2011). *Dravyaguna vijnana* (Vol. 2, Chapter 1, p. 58). Chaukhamba Bharati Academy.
12. Sharma, P. (2011). *Dravyaguna vijnana* (Vol. 2, Chapter 2, p. 111). Chaukhamba Bharati Academy.
13. Sharma, P. (2011). *Dravyaguna vijnana* (Vol. 2, Chapter 5, p. 433). Chaukhamba Bharati Academy.
14. Mishra, B. (2015). Bhavprakash (Vol. 1, Amradi Phla Varga, Chapter 6, Shloka no. 142-143, p. 394) [Commentary by Dr. Bulusu

REVIEW ARTICLE

- Sitaram, Foreword by Prof. K.C. Chunekar]. Chaukhambha Orientalia. (Reprint edition).
15. Sharma, P. (2011). Dravyaguna vijnana (Vol. 2, Chapter 1, p. 66). Chaukhambha Bharati Academy.
16. Sharma, P. (2011). Dravyaguna vijnana (Vol. 2, Chapter 5, p. 500). Chaukhambha Bharati Academy.
17. Sharma, P. (2021). Dravyaguna vijnana (Vol. 2, Chapter 5, p. 345). Chaukhambha Bharati Academy.
18. Sharma, P. (2011). Dravyaguna vijnana (Vol. 2, Chapter 2, p. 120). Chaukhambha Bharati Academy.
19. Sharma, P. V. (Trans.). (3rd ed.). (Year). Dhanvantari Nighantu (p. 74). Chaukhambha Orientalia.
20. Patil, D. V. C. (2018). Principles and practice of panchakarma, Chaukhambha Publications, New Delhi, chapter 9, Swedana karma, Page no - 247.
21. Ferraz, A. C., Angelucci, M. E. M., Da Costa, M. L., Batista, I. R., De Oliveira, B. H., & Da Cunha, C. (1999). Pharmacological evaluation of ricinine, a central nervous system stimulant isolated from *Ricinus communis*. *Pharmacology Biochemistry and Behavior*, 63(3), 367-375.
22. Taur, D. J., Waghmare, M. G., Bandal, R. S., & Patil, R. Y. (2011). Antinociceptive activity of *Ricinus communis* L. leaves. *Asian Pacific journal of tropical biomedicine*, 1(2), 139-141.
23. Ma, Z. F., Ahmad, J., Zhang, H., Khan, I., & Muhammad, S. (2020). Evaluation of phytochemical and medicinal properties of *Moringa* (*Moringa oleifera*) as a potential functional food. *South African Journal of Botany*, 129, 40-46.
24. Gaurav Parihar, G. P., & Neelam Balekar, N. B. (2016). *Calotropis procera*: a phytochemical and pharmacological review.
25. Agarwal, R., Gupta, R., Yadav, R., Asati, V., & Rathi, J. C. (2019). Anti-Inflammatory activity of seeds extract of *Datura stramonium* against carrageenan induced paw edema on albino wistar rats. *J. Pharm. Biol. Sci*, 7(1), 41-46.
26. Chandan, G., Kumar, C., Chibber, P., Kumar, A., Singh, G., Satti, N. K., ... & Saini, R. V. (2021). Evaluation of analgesic and anti-inflammatory activities and molecular docking analysis of steroidal lactones from *Datura stramonium* L. *Phytomedicine*, 89, 153621.
27. Kumar, P., & Kumari, S. (2020). Pharmacological Properties Of Nirgundi: A Review, *International Journal of Ayurveda and Pharma Research*. 2020;8(2):68-73.
28. Sookying, S., Duangjai, A., Saokaew, S., & Phisalprapa, P. (2022). Botanical aspects, phytochemicals, and toxicity of *Tamarindus indica* leaf and a systematic review of antioxidant capacities of *T. indica* leaf extracts. *Frontiers in Nutrition*, 9, 977015.
29. Oyebadejo, S. A., & Solomon, I. P. (2019). Physiochemical and phytochemical profiles of fresh citrus limon (L) juice Vol-1, Iss-2 (Mar-Apr 2009): 41-44.

REVIEW ARTICLE

Neeta, M. P., Nagpurkar Mukta, N. M., & Kulkarni Bilwa, K. B. (2015). Comparative qualitative phytochemical analysis of *Sesamum indicum* L, Special Issue-2: 172-181.