

# *Shashtika Shali Pinda Sweda* in the Management of Child Cerebral Palsy Spasticity

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## Abstract:

Children are the strength of a nation. Childhood period is the foundation of the life and it is here that seeds for healthy life are laid down, disabled children are of great concern to family as well as the society. Cerebral Palsy (CP) is the leading cause of chronic disability in children, making them socially apart. According to WHO (World Health Organization) approximation, in India estimated incidence of Cerebral Palsy is around 3 / 1000 live births. Spastic CP is the most common form of cerebral palsy and occurs in three-quarters of people affected. Considering the prevalence of spastic CP, the present study was designed to evaluate the role of '*Shashtika Shali Pinda Sweda*' in spasticity management. Present Study was carried out in 6 patients, by adopting following treatment protocol First 5 days *Udvardana*, next 5 days *Abhyanga* with *Bala Taila* & *Nadi Sweda* and next 8 days *Shashtika Shali Pinda Sweda*. The treatment was carried out in three courses with time span of 16 days between each course. *Medhya churna* was given as internal medication for 86 days along with three courses of *Panchakarma* procedures. It was found that *Shashtika Shali Pinda Sweda* helps in reducing the spasticity.

**Key words:** Cerebral Palsy, *Shashtika Shali Pinda Sweda*, *Medhya Churna*.

## Introduction:

Cerebral palsy means 'brain paralysis' also commonly referred to as CP, is an umbrella term that describes a group of disorders caused by damage to the brain. It results in physical impairment affecting body movement, coordination, balance and posture. Cerebral palsy is neither contagious nor progressive. Cerebral Palsy (CP) is the leading cause of chronic disability in children, making them physically and mentally handicapped and socially apart. The whole brain is not damaged, only parts of it, mainly parts that control movements. Once damaged, the parts of the brain do not recover, nor do they get worse. However, the movements, body positions, and related problems can be improved or made worse depending on how we treat the child and how damaged his or her brain happens to be. The earlier we start, the more improvement can be made.

The worldwide incidence of CP is approximately 2.5 cases per 1000 live births. For India it is estimated around 3 cases per 1000 live births but being a developing country the actual figure may be much higher than probable figure. The cerebral palsy being predominantly motor disorder, is often accompanied by other areas of problem like Mental retardation- 50-70 % most often in quadriplegia and ataxia CP. Seizures 25-33 % ;often in spastic hemiplegia & quadriplegia, least In dyskinetic CP. Hearing & speech defects 15-20% common in dyskinetic and quadriplegic CP. Ocular defects

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50-70 % ,Behavioral problems( Hyperkinetic behavior, aggressiveness, lack of attention) 30-50 %.(IAP Textbook of pediatrics vol 2).

### **Types of Cerebral Palsy :**

Cerebral palsy affects the messages sent between the brain and muscles in the body. There are three types of cerebral palsy:

Spastic

Athetoid (or dyskinesic)

Ataxic

In general, these three types relate to the part of the brain that has been damaged or affected. The effects of cerebral palsy vary enormously from one person to another, with some people experiencing a combination of two or more types.

### **Spastic cerebral palsy :**

Spastic means 'stiff'. This form of cerebral palsy causes the muscles to stiffen and decreases the range of movement in the joints. It is the most common form of cerebral palsy and occurs in three-quarters of people affected. A child with spastic cerebral palsy has to work hard to walk or move.

In 1980 Lance defined spasticity as:

“A motor disorder characterized by a velocity- dependent increase in tonic stretch reflexes (muscle tone) with exaggerated tendon jerks, resulting from hyper excitability of the stretch reflex, as one component of the upper motor neuron syndrome.”

The impact of spasticity is extremely variable, ranging from minor discomfort to complete immobility with pressure sores and contractures. On a functional level walking may be slower or more difficult, falls more frequent, or the ability to self-propel a wheelchair or transfer compromised. Likewise activities of daily living including washing, dressing, and toileting activity can be affected. Spasticity can be responsible for muscle shortening and the development of tendon and soft tissue contracture. Spasticity, leads to failure of normal muscle growth, which can result in torsion of long bones and consequent joint instability and degeneration. Once present, these are often very difficult to modify, with long-lasting major functional implications.

A characteristic feature of spasticity is the hypertonia, which is dependent upon the velocity of

the muscle stretch in other words, greater resistance is felt with faster stretches (this results in the clinical sign of a 'spastic catch'). Thus, spasticity resists muscle stretch and lengthening. This has two significant consequences. First, the muscle has a tendency to remain in a shortened position for prolonged periods, which in turn may result in soft tissue changes and eventually contractures (Goldspink & Williams, 1990).

In today's era, there is a wide range of physical and pharmacological treatments available, which if used timely and appropriately can be effective at reducing pain and discomfort without compromising function, while preventing secondary complications such as contractures or pressure sores.

Management of children with CP requires an interdisciplinary approach. Reduction of spasticity is only one of many facets of the overall management of the cerebral palsy. Modern medicines used for relieving spasticity like Baclofen, Dantrolene sodium etc. are generally limited and benefit them from mild reduction of spasticity. Moreover higher dosages are associated with systemic side effects like weakness, behavior changes and other central side effects hence limiting their usefulness.

Physiotherapy is accepted worldwide as a rehabilitation procedure. The treatments available are sophisticated and highly expensive which are out of reach from low income groups and so parents accept their child with locomotor disability without attempting to improve the condition.

Cerebral Palsy cannot be correlated with any single disease or condition, as it is a multi-factorial disease with clinical features of wide variation. Considering the classification and individual features of Cerebral Palsy, it can be taken as nearer condition of *Vata Vyadhi* or *Vata Vikara* or *Vata* predominant condition. Analyzing the conceptual evaluation of this disease phenomenon, major role of *Vata* and disease presentation is nearer to *Vata Vyadhi* or *Vata* predominant condition lead the principles of treatment mainly of *Vata Vyadhi*. As the prevalence of spastic CP is more, the present study was designed to evaluate the role of '*Shashtika Shali Pinda Sweda*' in spasticity management. So in present work was planned to study etiopathogenesis of CP, decrease spasticity and improvement in range of motion and to

study the effect of Medhya churna.(On the basis of subjective parameter)

**Materials and Method:**

**DRUGS : FOR PROCEDURE**

For *Udvartana* : With *Yava* and *Kulattha Churna* in same proportion for 20 mins.

For *Abhyanga*:With *Bala Taila* for 20 mins.(5 days) followed by *Nadi Swedana* for 20 mins.

*Shashtika Shali Pinda Sweda* (SSPS): With *Shashtika Shali* (rice grown in 60 days) and Milk

**Diagnostic criteria:** Children with complaints of spasticity or dysfunction in limbs and delayed developmental milestones and already diagnosed cases of CP were selected for this study.

**Inclusion Criteria :**

- 1.Children with C.P. 6 months to 10 yrs. of both sexes.
- 2.Children with developmental disability both either physical or mental, in mild or moderate degree as compared to other normal children.

**Exclusion Criteria :**

- 1.Children's age < 6 months and > 10 yrs.
- 2.Children of C.P. with major congenital disorder & other disease status viz, Juvenile DM, Acute infections etc.

**For Internal Medicine:** A Compound containing six herbs was selected for the present study. These drugs were selected on the basis of their properties beneficial in the management of cerebral palsy. *Medhya Churna*, throughout the treatment schedule.

**Dosage:** According to *SharangdharaSamhita*.( In Two Divided Doses), **Sahapana:** *Madhu*.

**Panchakarma procedure:** *Shashtika Shali Pinda Sweda* (SSPS) was carried out for 45 mins.

**Requirements:**

Decoction of <i>Bala</i>	1 liter
Milk (preferably cow milk)	1 liter
<i>ShashtikaShali</i> Rice	100 grams
4 pieces cotton cloth	15”x 15”

**Pre -procedure:** The rice is cooked in the decoction of *Bala* and milk. Consistency of cooked rice should be similar to *Payasa* or *Khira*, after this, boluses (*pinda/pottali*) are prepared.

**Main-procedure:** The boluses are then kept in the mixture decoction of *Bala* and milk in the vessel being continuously heated on stove *then* the patient is used to anointed with suitable oil and massaged with the help of *pinda* on affected part of the body.

**Post-procedure:** After the massage, the paste of rice was gently wiped out from the body. The patient should be allowed to take rest at a place where there is no direct air contact and then take bath with warm water.

The treatment was carried out in three courses with time span of 16 days between each course. Total duration: 86 days.

**Observation**

**1) Age:** Maximum number of patients i.e. 66.66 %

**Table 1: Ingredients of Medhya Churna:**

INGREDIENTS	BOTANICAL NAME	PART USED	RATIO
<i>BRAMHI</i>	<i>Bacopamoneri</i>	<i>ShuskaPanchanga</i>	1 part
<i>VACHA</i>	<i>Acoruscalamus</i> Linn	<i>Mula</i>	1/4 part
<i>SHANKHPUSHPI</i>	<i>Convolvuspluricaulis</i> Chois	<i>ShuskaPanchanga</i>	1 part
<i>YASHTIMADHU</i>	<i>Glycirhizaglabra</i> Linn	<i>Shuska Kanda</i>	1 part
<i>GUDUCHI</i>	<i>Tinosporacordifolia</i> Willd.	<i>Shuska Kanda</i>	1 part
<i>PIPPALI</i>	<i>Piper longum</i> Linn	<i>ShuskaPhala</i>	1/4 part

**Table 2: Posology of Medhya Churna**

Age Group	Dose
6 Months - 1 Year	750 mg
1-3 Years	1.5 gm
4 -7 Years	4 gm
8 – 10 Years	7 gm

**Table 3: Details of Course of therapy:**

FIRST COURSE	SECOND COURSE	THIRD COURSE
5 days <i>Udvartana</i>	5 days <i>Udvartana</i>	5 days <i>Udvartana</i>
5 days <i>Abhyanga</i> with <i>balataila</i> & <i>nadi sweda</i>	5 days <i>Abhyanga</i> with <i>balataila</i> & <i>nadi sweda</i>	5 days <i>Abhyanga</i> with <i>balataila</i> & <i>nadi sweda</i>
8 days <i>Shashtika Shali Pinda Sweda</i> .	8 days <i>Shashtika Shali Pinda Sweda</i> .	8 days <i>Shashtika Shali Pinda Sweda</i> .
16 days interval	16 days interval	

was below 7 year of age. It shows the parental concern regarding requirement of an early intervention to the disease and particularly pursuing the knowledge of *Ayurvedic* treatment in managing these type of condition.

**2)Sex:** Greater number of male patients i.e. 83.33 % was registered in this study which supports the higher prevalence of CP in male. The reported incidence of CP by the Surveillance of Cerebral Palsy in Europe (SCPE) is higher in males than in females and it is 1.33: 1. [1]

**3) Socio-economic status:** Low SES was found in 33.33 of patients and low middle SES was found in 66.66 %. As per research work done by As Dolk H, Pattenden S. et al shows that, less health consciousness, unhygienic environment and deficiency in proper antenatal and obstetrical care in low economic group are probably leading to higher

Grade	Ashworth scale : Degree of muscle tone
0	no increase in muscle tone
1	slight increase in muscle tone, manifested by a catch and release or by minimal resistance at the end of the range of motion when the affected part(s) is moved in flexion or extension
2	slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the remainder (less than half) of the ROM
3	more marked increase in muscle tone through most of the ROM, but affected part(s) easily moved
4	considerable increases in muscle tone, passive movement difficult
5	affected part(s) rigid in flexion or extension
	Upper extremities : Left
	Right
	Lower extremities : Left
	Right

**Table 4: criteria for assessment:**

Sr. No.	Particulars	Mean BT	Mean AT	Mean df	% Change	SD	SE	't' Value	'P' Value	Result
1.	Upper Limb Rt.	4.667	2.167	2.500	54.167	0.837	0.342	7.319	P=0.001	significant
2.	Upper Limb Lt.	4.800	3.600	1.200	25%	0.837	0.374	3.207	P=0.033	significant
3.	Loswer Limb Rt.	4.667	2.167	2.500	55%	1.049	0.428	5.839	P = 0.002	significant
4.	Lower Limb Lt.	4.800	2.800	2.000	41%	1.414	0.632	3.162	P=0.034	Significant

**Table 5: Effect of treatment on spasticity**

incidence of CP [2], supportive observation in present study was found.

**4) Maternal antenatal history:**

H/o mental stress - In antenatal history mental stress was found in 33.33 % of mothers. This observation admits the role of psychological components (i.e. mental stress) along with other physical and pathological factors in developing CP. One study by Pierre Gressens, concluded that mild stress during pregnancy may increase the chances of a child being born with Cerebral Palsy [3]. Further it was also added that limiting the stress during human pregnancy might prove to be a cost-efficient way to reduce the emotional, social and economic burden of Cerebral Palsy. Observation as well as research particulars are in favor to accept the role of psychological components for their causatively in abnormal outcome either CP or other anomalous conditions. Ayurvedic concepts like *Garbhini Paricharya*, *Garbhopaghatakara Bhava*, *Douhradayav amanana* etc pointing towards the same.

**5) Mode of delivery:** Observation on mode of delivery was found that normal home delivery was observed in 33.33%, normal hospital delivery in 33.33% , LSCS in 16.66%, Forceps and Vacuum assisted in 16.66% patients.

As per earlier reported data, obstetric events predisposing to birth trauma include instrumental delivery and vacuum extraction [4]. But a study conducted by Steer and Bonney (1979) have found no connection between complications of birth and mode of delivery [5]. It is thought that anoxia during fetal development put the fetus at risk of injury at birth. Prenatal lesions are the cause of neonatal anoxia, falsely credited to birth trauma. The primary cause is

fetal maldevelopment; birth is only a secondary factor. In this present study CP developed in the patient though greater number of mother (66.66%) having normal delivery. So mode of delivery did not show any direct correlation with the incidence of CP. To establish this relation with CP, may be large sample size study is needed.

**6) Term of gestation:** Term of gestation at the time of birth was preterm in 16.66 % whereas full term in maximum number i.e. 83.33%. Stromberg B. et al. has concluded that prematurity is one of the two most important risk factors for CP universally [6]. Observation of this study supports above reference and also suggests the possible incidence of CP even in full term infant.

**7) Birth weight:** 33.33% were belonged to LBW (< 2.5 Kg) whereas 50 % had Normal birth weight ( $\geq 2.5$  Kg). while 16.66 % had VLBW (< 1.5 kg).

This finding is in favor to the conclusion of Stromberg B. et al. that low birth weight (LBW) is one of the most important risk factors for Cerebral Palsy [6]. This may be result of unfavorable prenatal factors hampering the growth of fetus in utero.

**8) Specific natal history:** Probable risk factors for CP and natal history components in 06

Patients of CP were observed i.e. prolonged labour (33.33%), birth asphyxia (66.66%), septicemia (66.66%), convulsion (33.33%), pathological jaundice (16.66%) . These all are the established contributory natal factors for developing Cerebral Palsy.

**9) First cry after birth:** H/o delayed cry was observed in 83.33 % of patients. Delay in achieving respiration after birth may cause serious injury to the newborn brain by interruption of oxygen (*PranaVayu*) supply [3]. Research studies have been reported that babies who suffer a delay in the onset of respiration by five minutes or more stand a high risk of such injury leading to CP [4]. Ayurveda also stressed on proper *Prana Prtyagamana Vidhi*, which indicates awareness of *Acharyas* regarding the importance of onset of respiration in newborn.

**10) Requirement of assisted medical care:** 66.66% of patients required hospitalization immediately after birth and out of those 75 % patients were required resuscitation.

This assisted medical care, especially neonatal resuscitation is normally used to manage birth

asphyxia. If asphyxia is partial and prolonged, as seen in common, bilateral parasagittal watershed injury occurs in term infants and bilateral periventricular end and border zone injury occurs in preterm infants. As here in present study, observational data shows, role of birth asphyxia is clear in development of CP.

**11) Sign and symptoms:** Developmental delay, feeding problem, language impairment, vision problem, and mental retardation were observed in 100%, 100%, 100%, 33.33%, 11.11% and 100% of patients respectively. Impaired co-ordination, orientation, attention were found in 33.33%, 66.66 %, 66.66% of patients respectively.

**12) Severity of the condition:** Among 06 patients of CP, Moderate and Severe types according to severity of the condition were observed in 16.66 % and 83.33 % patients respectively.

**13) Presence of associated complaints:**

Recurrent Respiratory Tract Infections (RRTI): Half number i.e. 66.66% patients were having history of recurrent respiratory tract infection.

This observation is found in relation with established study, which reports that pulmonary dysfunction is commonly present in Cerebral Palsy [7]. Feeding problem, more dependency on milk, less mobility and lack of achieving bladder/bowel control like associated conditions, add to this recurrence. Respiratory compromise in children with CP is also reported as a major cause of morbidity and mortality, especially among with severe motor involvement [8]. Recurrent diseases occurs in majority of CP patients, may be due to *Hina Bala (Sahaja, Yukti Kruta and Kala Kruta)* in particular disease.

**Achievement of bowel and bladder control:** 66.66 % patients had not achieved bladder as well as bowel control.

Bowel and bladder issues are common in patients with CP. There is predisposition in children with CP to achieve continence (control) at a later age than unaffected children [9]. *Acharya* Charaka also stressed that excretion of *Mala* (here urine and stool) is the function of *Prakrita Vayu*, thus this higher incidence of problem in achieving bowel and bladder control can be understood, as *Vata Dosha* vitiation is the prime cause of CP.

Related studies conclude that difficulty in feeding is due to problem with sucking, swallowing, chewing and controlling the tongue movement. It is

also established that co-morbidities like excessive salivation and constipation are common in CP populace [7]. Findings are in the way to support these research conclusions.

**14) Dietary pattern:** 66.66 % and 33.33 % were taking semisolid and solid diet respectively.

Various studies reports that, patients with CP are at increased risk for dysphagia [8]. Majority of the patients may have oro-motor dysfunction and oropharyngeal dysfunction in which impaired coordination hampers the ability to chew and swallow [7]. Similar observations were found in the study where in majority of the patients were on diet other than solid which is 66.66 %.

None of the patient registered were able to take feed independently.

**H/o Consanguinity** - Al Rajeh et al. has investigated that there is 2.5 fold increases in the occurrence of CP in consanguineous families and also raised the possibility of existence of recessive forms of CP [10]. In present study, there were 2 patients from consanguineous family, which may be due to small sample size.

**15) Parental history:** Abortion of the mother was observed in 33.33 % patients

**H/o Abortion** - Observed finding are supported with a study which has explored out a link between **abortion** and Cerebral Palsy from the data of more than four million births [3].

**16)Anti-epileptic drug for seizure** - AED was continued to control the seizure activity as rapidly as possible and prevent seizure recurrence. This observation supports the results of study done by Koman et al; they concluded that, Seizure disorders are present in 50% of patients with CP [11].

## Discussion

Total 8 patients were registered in the study out of which 6 patients were completed the study and 2 were discontinued due to illness. Spasticity was assessed in upper and lower limbs over ankle and knee joint. It consists of 6 grading levels starting from 0 to 5. Among 6 patients of Spastic CP, 5 patients were quadriplegic and one was hemiplegic. Statistical assessment was done by paired 't' test. The result after completion of course was statistically significant in both upper and lower limb.

The study drug *Medhya churna* contained six drugs. Selection of ingredients was based upon the results of studies supporting to improve the status of CP patients on various aspects. The main purpose of selecting drugs was to bring the normalcy of *Vata*.

Property of the drugs was *Vatahara, Balya, Medhya* and *Brimhana* for the proper nourishment of *Dhatu*. The effect of *Medhya Churna* can be understood on principles of modern perspective as follow:

Drugs capable of regenerating neurons are *Bramhi* which has shown to increase length of dendrites of Amygdaloid neurons ( K.G.Mohandas Rao et al 2007); Nerve regeneration capacity ( Amala et al 2010), Drugs having Neuroprotective role are *Bramhi* ( Khan R et al ); *Vacha* ( S.R.Yendeet.Al.,2009);( Shukla PK,et al.); *Pippali* (Min Fu et al.2010); *Yasthimadhu*-(Muralidharan et al 2009).

*Udvardana* was carried out with *Yava* and *Kulathya Churna*. In present study Spastic CP is considered as a *Vata Vyadhi* in which *Vata* is become *Aavarita* (getting covered) by vitiated *Kapha* at the site of *Mastulunga* which is again the natural site of *Kapha*. So to remove the *Srotorodha* and to open the channel *Ruksha Churna* (*Yava* and *Kulattha*) *Udvardana* is taken prior to all other procedures in the present study.

*Abhyanga* was carried out with *Bala taila*. The effect of *Abhyanga* can assume in two ways:

- 1) Effect of drug in the medicated oil.
- 2) Physical manipulation.

The medicated oil helps in preventing muscular atrophy and improving tone. *Bala* is *Vatashamak* and *Balya*, with the help of oil media it is absorbed locally and provides nutrition to muscular tissues thereby preventing atrophy of muscles. The *Taila* shows its action by the following property of *Snehana*:

*Snigdha guna* acts through its *Vatahara* and *Kaphahara* properties. It performs the action like *Snehana*, *Kledana* and *Vishyandana* at cellular level of the body. *Kaphahara* is well balance by *Ushnavirya* of *Tilataila*.

*Guru Guna* increases the *Kapha* and gives strength to the muscle and joints.

*Mridu Guna* is the opposite attribute of *Kathinya* i.e. hardness. By this property *Abhyanga* reduces the stiffness. By *Drava Guna Snehana* drug propagates swiftly all over the body. It liquefies the *Doshas* and mobilizes them by increasing their flowing capacity. *Pichchhil Guna* causes longevity, increases body strength and maintains the structure at molecular level.

Physical manipulation in the form of massage increase the circulation of blood and plasma,

it can stimulate and strengthen the lymphatic system and remove internal waste products. Muscle and deep connective tissues get relaxation. The strokes used in *Abhyanga* viz. kneading and friction also have effect like - Increase in flow of circulation local to the area treated.

Reduction of tone in muscles, which are in a state of excess tension.

Stretching of tight fascia and restoration of mobility of soft tissues.

Relief of pain is obtained by releasing acute or chronic tension in muscles and by affecting pressure and touch nerve endings.

The main part of *Abhyanga* procedure is the mechanical stimulation more precisely the pressure application during massage therapy. Pressure application done in proper way can help in reduction of motor neurone hyperexcitability by reducing the alpha motor neurone activity. The way of mechanism of action is not clearly understood.

In a study, cerebral palsy symptoms in children decreased following massage therapy ( Maria Hernandez Reif et al 2005) but the mechanism behind it was not explained in the study. In this way *Abhyanga* acts through the above properties of *Sneha*, because all the properties are opposite to the *Vata*. *Abhyanga* is considered useful treatment in the diseases occurred by provoked *Vata*.

*Shashtika Shali* is *snigdha*, *Sthira*, *Balavardhana* and *Dehadardhyakrita*. *Bala* and *Godugdha* that is used to cook the *Shashtika Shali* and to heat the bolus is *Snigdha*, *Balya Rasayana* and *Vatahara*. Further the *Swedana* cleans and opens up the channels of *Srotas* thus facilitates more nourishment and free movement of *Vata dosha*. This result in the relief of spasticity and facilitates more nourishment and free movement of the joints and preventing deformities and contractures.

### Conclusion:

The overall result notes that the effect of *Shashtika Shali Pinda Sweda* is helpful in reducing the spasticity, joint deformities, prevention of contractures and thereby facilitating for early achievements in areas of ADL by improving muscle tone, gain in muscle strength, proper nourishment of *Dhatu*s. Improvement of intelligence for better skill performance was noted which may be due to the action of *Medhya Churna* on brain. Furthermore SSPS is proved better to altering deranged neuromotor function and more suitable for disable and feeble patients. The efficacy of intervention

and prognosis of the disease gets adversely affected with the advancement of age. This presumption also gets promoted by the observation of this study. Further extensive study is needed to authenticate the results of the present study with larger samples.

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