

**MANAGEMENT OF CEREBRAL PALSY DUE TO HYPOXIC-ISCHEMIC ENCEPHALOPATHY THROUGH PANCHAKARMA:  
CASE STUDY**

**\*<sup>1</sup>Parul Sharma, <sup>2</sup>Ved Bhushan Sharma and <sup>3</sup>Mohita Bohra**

<sup>1</sup>M.D.(Ay.) Panchkarma, Medical Officer, Department of Panchakarma, Rishikul Campus (Haridwar), Uttarakhand Ayurved University, Dehradun.

<sup>2</sup>M.D.(Ay.) Rasshastra & Bhaisajya Kalpana, Medical Officer, Department of Agad Tantra, Rishikul Campus (Haridwar), Uttarakhand Ayurved University, Dehradun.

<sup>3</sup>MD 2<sup>nd</sup> Year Scholar, Department of Panchakarma, Rishikul Campus (Haridwar), Uttarakhand Ayurved University, Dehradun.

Article Received on  
28 July 2015,

Revised on 26 Aug 2015,  
Accepted on 16 Sep 2015

**\*Correspondence for  
Author**

**Dr. Parul Sharma**

M.D.(Ay.) Panchkarma,  
Medical Officer,  
Department of  
Panchakarma, Rishikul  
Campus (Haridwar),  
Uttarakhand Ayurved  
University, Dehradun

**ABSTRACT**

HIE (Hypoxic Ischemic Encephalopathy) is known to be the most common cause of cerebral palsy and is a brain injury caused by the decreased oxygen supply to the brain during child birth, which further can cause motor & cognitive impairments, developmental delay and even death in severe case depending on the area affected by the lack of oxygen. According to the signs and symptoms it can be correlated with *Pakshaghata* in *Ayurveda*. As *Pakshaghata* is purely *Vataja* disorder, so the treatment includes nourishing and strengthening therapies like *snehan*, *swedan* and *basti* mentioned in *Ayurvedic* texts for the management of *Vata Vyadhi*. The general condition, neurological impairment and all the associated features is found to be significantly improved after the administration of this treatment in a patient of unilateral spastic type of cerebral palsy / infantile hemiplegia due to HIE.

**KEYWORDS:** Hypoxic Ischemic Encephalopathy, cerebral palsy, *Pakshaghata*, *Vata Vyadhi*, Infantile hemiplegia.

**INTRODUCTION**

Hypoxic-ischemic encephalopathy or HIE, is the brain injury caused by oxygen deprivation to the brain, also commonly known as intrapartum asphyxia (during birth). Hypoxic-ischemic

encephalopathy due to foetal or neonatal asphyxia is a leading cause of death or severe impairment among infants. Such impairment can include epilepsy, developmental delay, motor impairment, neurodevelopmental delay and cognitive impairment. Usually the severity of impairment cannot be determined until a child is three to four years old. Hypoxic ischaemic encephalopathy is one of the most common causes of cerebral palsy and other severe neurological deficits in children, occurring in 2-9 of every 1000 live births.<sup>[1]</sup> Although term infants with mild encephalopathy generally make a full recovery, 20% of affected infants die in the neonatal period and another 25% develop significant neurologic sequelae. For preterm infants, compared with term infants, the overall prognosis is worse. In the term infant, the most common mechanism of hypoxic injury is intrauterine asphyxia brought on by circulatory problems, such as clotting of placental arteries, placental abruption, or inflammatory processes.<sup>[2]</sup> Reduced cardiac output in the setting of hypoxia is referred to as hypoxic-ischemia (HI).<sup>[3]</sup> If an episode of HI is severe enough to damage the brain, it leads within 12 to 36 hours to a neonatal encephalopathy known as hypoxic-ischemic encephalopathy (HIE).<sup>[4]</sup> Perinatal hypoxic-ischemic encephalopathy (HIE) occurs in one to three per 1000 live full-term births.<sup>[5]</sup> The principle pathogenic mechanism underlying neurological damage in HIE resulting from hypoxemia/ischemia or both is deprivation of glucose and oxygen supply which causes a primary energy failure and initiates a cascade of biochemical events leading to cell dysfunction and ultimately to cell death.<sup>[6]</sup>

In Ayurveda it can be described as *Pakshavadha* which is described by different names such as *Pakshaghat*, *Ardhanga Vata*, etc. It is stated that the vitiated *Vata Dosha* destroys either half of the body (Right or Left) producing symptoms like restriction of movements, pain and difficulty in speaking.<sup>[7]</sup> Causative factors such as inappropriate Ritu, Kshetra, Ambu and Bija<sup>[8]</sup> *Dauhrida Avmanana*,<sup>[9,10]</sup> (negligence of pregnancy craving), presence of *Garbhopaghatakarabhava*<sup>[11,12]</sup> incompatible *Garbha Vriddhikarabhava*,<sup>[13]</sup> and improper following of *Garbhini Paricharya*<sup>[14,15]</sup> (antenatal care), may have undesirable effect on the foetus *in-utero*. The *Vataja* diet regimen and conduct during pregnancy and all the other factors vitiates the *Vata* in the body and it causes desiccation of the Dhatus (*Mamsa-sira-snayu Shoshana*)<sup>[16]</sup> which leads to decreased mobility and power of one-half of the body.

## CASE STUDY

This is the case of a five years old female child with lean and thin appearance and irritable mental disposition with chief presenting complaints-

- Unable to stand without support.
- Able to sit for a moment without support.
- Unable to walk with support.
- Weakness in right side of body.
- Increased tone in right side of body.
- Delayed mile stones.
- Lispings during speech.
- A short term memory and impaired new learning abilities.

The child was full term born by LSCS, the birth weight was 2 kg., which is under the category of low birth weight and child didn't cry soon after birth. There is also a history of jaundice soon after the birth which remained for a period of 10 days.

### Physical Examination Findings

The general condition of patient was moderate with normal cardiovascular and respiratory system functions. Height is 95 cm and weight of child is 12 kg. which is low for age.

[Table 1] - Examination findings

Motor examination	Right limb		Left limb	
	Upper	Lower	Upper	Lower
Muscle bulk	Wasting present	Wasting present	Normal	Normal
Muscle power	Grade 3	Grade 3	Grade 5	Grade 5
Muscle tone	Hypertonic	Hypertonic	Normal	Normal
Deep tendon reflex				
Biceps	Exaggerated	Exaggerated	Normal	Normal
Triceps	Exaggerated	Exaggerated	Normal	Normal
Knee	Exaggerated	Exaggerated	Normal	Normal
Ankle	Exaggerated	Exaggerated	Normal	Normal
<b>Sensory examination</b>				
Touch	Normal		Normal	
Pain	Normal		Normal	
Temperature	Normal		Normal	
<b>Co-ordination test</b>				
Finger nose test	Normal			
<b>Gait</b>	Spastic			
<b>Involuntary movements</b>	Absent			

### Delayed mile stones

The delayed mile stones in comparison to their right age of attainment are shown in the table no. 2

[Table 2]– Comparison of delayed mile stones with right age of attainment

Mile Stones	Attained age	Right age
<b>1. Gross Motor</b>		
Neck holding	10 <sup>th</sup> month	3 <sup>rd</sup> month
Sitting with support	13 <sup>th</sup> month	5 <sup>th</sup> month
Standing with support	15 <sup>th</sup> month	9 <sup>th</sup> month
<b>2. Language</b>		
Pronouncing mono-syllabus	11 <sup>th</sup> month	6 <sup>th</sup> month
Pronouncing bi-syllabus	13 <sup>th</sup> month	9 <sup>th</sup> month
<b>3. Social development-</b>		
Bed wetting (at night)	Present	36 <sup>th</sup> month

### MRI (T2) findings

Periventricular white matter hyper-intensity with mild dilatation of Left lateral ventricle. These findings are suggestive of HIE.

### Diagnosis

Infantile hemiplegia due to HIE

### Treatment Plan

The total duration of treatment was 4 months in which mainly the *Vata Shamaka Panchakarma* therapy along with oral drug was given.

A) Treatment in 1<sup>st</sup> sitting (for 30 days) -

➤ For first 15 days -

1. *Sarvang Abhyanga* – *Dhanwantar* oil  
*Sarvang Mridu Nadi Swedana* – *Dashmool Kwath*
2. *Shiro-pichu* – *Ksheerbala* oil

➤ For next 15 days –

1. *Annalepana* - *Shashtika* rice, *Ashwagandha churna*, *Bala* root, cow's milk
2. *Shiro-talam* - *Amalaki* paste, *Ksheerbala* oil
3. *Kaal Basti* - for a period of 15 days, *Niruha* and *Anuvasana* on alternate days.
  - *Niruh Basti* – *Yaapana Ksheer Basti* – 100 ml.
  - *Anuvasan Basti* – *Mahamaash* oil - 10 ml.

B) Oral medicine

Given to patient between 2 *Panchakarma* therapy sittings for a period of 2 months

1. Syrup *Shankhpushpi* - 10 ml. BD  
*Ashwagandha churna* - 1.5 gm. BD with milk

C) Treatment in 2<sup>nd</sup> sitting (for 30 days) – The treatment which was given during 1<sup>st</sup> sitting was repeated.

## RESULT

### BT-AT Comparison

Such 2 sittings of 1 month each are given to the patient at interval of 2 month. After 4 months of treatment the improvement in the signs and symptoms of the patient is shown in table no. 3.

[Table 3] – BT-AT comparison

Before Treatment		After 1 <sup>st</sup> sitting		After 2 <sup>nd</sup> sitting
Sit only for a moment with-out Support		Able to sit for 30 sec.		Able to sit without support
Unable to Stand Without Support		Able to stand momentarily without support		Able to take steps holding support
Unable to walk With Support		Able to walk 3-4 steps with support		Able to walk with support
CNS Examination		Before Treatment	After Ist sitting	After 2 <sup>nd</sup> sitting
Nutrition of The Muscle	Right	Significant Atrophy	Muscle bulk improved	Muscle bulk much improved
	Left	Normal	Normal	Normal
Muscle Tone	Right	Hyper-tonicity +++	Hyper-tonicity ++	Hyper-tonicity +
	Left	Normal	Normal	Normal
Plantar Reflex	Right	Extensor	Extensor	Extensor
	Left	Flexion	Flexion	Flexion
Knee Jerk	Right	++++	+++	++
	Left	Normal	Normal	Normal
Ankle Jerk	Right	++++	+++	++
	Left	Normal	Normal	Normal
Gait	Spastic	Spastic	Spastic	Spastic
Muscle Power	Right	Grade- 3	Grade- 3+	Grade- 4
	Left	Grade- 5	Grade- 5	Grade- 5
Mental Status				
Speech		Lisping present	Lisping present	Lisping reduced
Memory		Short term New learning Abilities impaired	Mild improvement	Significant improvement
Mood		Anxious and Irritable	After 1 <sup>st</sup> sitting- Anxeity, irritability	After 2 <sup>nd</sup> sitting- Anxeity, irritability- Significantly

## DISCUSSION

The diagnostic and assessment criteria have shown that the degree of HIE patient suffers is of moderate type. The treatment plan was devised in order to improve the overall condition of the patient. Also, the symptoms relate it to the *Pakshavadha* described in Ayurveda which is a *Vataja* disorder and thus the treatment was planned on the line of *Vatavyadhi Chikitsa*. The 4 months of treatment had significant improvement in the condition of the patient.

### **The probable mode of action of the Treatment Procedures:**

The *Sarvanga Abhyanga* and *Nadi Sweda* provide nourishment; pacify *Vata* and produces softness as *Mardavajanan* (production of softness) is the property of both *Abhyanga* and *Swedana*. *Dhanwantaram* oil contains mostly *Vata* pacifying and *Balya* (nourishing) ingredients, thus, can be attributed to pacify *Vata* and provide nourishment. In addition, the *Dashmoola Kwatha Nadi Swedana* pacifies *Vata*, as the main action of *Dashmoola* being *Vatahara* it also acts to reduce spasticity (*Stambha*), Hypertonicity (*Gaurava*), and produces sweat thus softening the skin. The *Shiropichu* followed by head massage improves the blood circulation thus soothes the mind and stabilizes the irritability and anxiety of the patient. The *Ksheerabala* oil used in this process provides nourishment to the brain and improves mental abilities. The *Annalepana* not only provides the benefit of both *Snehana* and *Swedana Karma* but the medicinal properties of the drugs used here provide nourishment to atrophied and wasted muscles and also helps in reducing the tonicity and spasticity. *Shiro-talam* helps the patient to keep calm during therapy as well as afterwards. “*Basti Vataharanam*”, is known to be the best to pacify *Vata*. This series of *Basti* given in the schedule of *Kaala Basti* alleviates *Vata*, purifies the body by removing toxins carrying out *Mridu-shodhana* and also the contents of the *Yaapana Basti* and the *Anuvasana* provide nourishment to the patient. As *Virechana* is indicated in the treatment of *Pakshaghata* but the age of the child here is not appropriate for *Virechana Karma* so, *Mridu Shodhana* was carried using *Basti Chikitsa*. The *Mahamasha* oil (used in *Anuvasana Basti*) is said to destroy all *Vata Disorders* like *Pakshaghata*, *Ardita*, *Badhirya*, *Hanugraha*, *Karnanada*, *Shirah-shoola*, etc.<sup>[17]</sup>

As there is nervous damage present thus, the drugs used are specifically nourishing and rejuvenating like *Rasayanas* described in *Ayurveda*. The *Medhya Rasayana* such as *Ashwagandha* (*Withania somnifera*), *Shankhapushpi* (*Centella asiatica*), etc have nootropic effects (Stimulation of Mental activities and increasing intellect) as they are nervine tonics.<sup>[18]</sup>

Thus, by the combined actions of the different therapies and drugs, there is overall relief in the symptoms of the patient as per the results shown. All this progress attributes to the *Vata Shamaka* and *Brihmana* properties of drugs used in the treatment.

## CONCLUSION

As observed from the results, in first two months the effects of the treatment were a success, though minimal which results in decreased atrophy and hyper tonicity of the muscle with some improvement in mental functions. Whereas when the treatment was further extended there was significant improvement in almost all the parameters taken. The time interval for sitting and walking with and without support increased and the atrophy and hyper tonicity decreased significantly, the muscle power increased to grade 4 in both right upper and lower limb and a significant improvement was noted in mental functions. Hence, the damage brought about by HIE though not fully reversed but can be improved to a significant extent especially in case of moderate Cerebral Palsy as this one. And with the continuation of the treatment we hope for much better results coming forth.

## REFERENCES

1. Johnston MV, Hoon AH Jr, Cerebral palsy. *Neuromolecular Med.* 2006; 8(4): 435-50. [[PubMed](#)]
2. Locatelli A, Incerti M, Ghidini A, Greco M, Villa E, Paterlini G. Factors associated with umbilical artery acidemia in term infants with low Apgar scores at 5 min. *Eur J Obstet Gynecol Reprod Biol.*, 2008; 139(2): 146-50. [[PubMed](#)]
3. Liu J, Li J, Gu M. The correlation between myocardial function and cerebral hemodynamics in term infants with hypoxic-ischemic encephalopathy. *J Trop Pediatr.*, 2007; 53(1): 44-8. [[PubMed](#)]
4. Volpe JJ. Perinatal brain injury: from pathogenesis to neuroprotection. *Ment Retard Dev Disabil Res Rev.*, 2001; 7(1): 56-64. [[PubMed](#)]
5. E. M. Graham, K. A. Ruis, A. L. Hartman, F. J. Northington, and H. E. Fox. A systematic review of the role of intrapartum hypoxia-ischemia in the causation of neonatal encephalopathy. *American Journal of Obstetrics and Gynecology.*, 2008; 199(6): 587–595.
6. J. M. Perlman. Summary proceedings from the neurology group on hypoxic-ischemic encephalopathy. *J. Pediatrics.* 2006; 117(3): S28–S33.

7. Pandit Kashi Nath Shastri, Dr. Gorakh Nath Chaturvedi (Editors), Charaka Samhita of Agnivesha, Chikitsa Sthan, Vtavyadhi Chikitsa Adhyaya, Chapter 28, Verse 53-54; Chaukhamba Bhartiya Academy Varanasi, 2011, pp.787.
8. Kaviraj Dr.Ambika Datta Shastri (Hindi Commentator); Commentary, Ayurveda-tatvasandeeepika on Sushrutaa Samhita of Acharya Sushrutaa, Sharira Sthan, Sukrashonita Shuddhi Sharira, Chapter 2, Verse 33, Chaukhamba Sanskrita Sansthan Varanasi., 2010; 2(33): 17.
9. Pandit Kashi Nath Shastri, Dr. Gorakh Nath Chaturvedi (Editors), Charaka Samhita of Agnivesha, Sharira Sthana, Atulyagotriya Sharira, Chapter, Verse; Chaukhamba Bhartiya Academy Varanasi., 2011; 2(17): 841.
10. Kaviraj Dr.Ambika Datta Shastri (Hindi Commentator); Commentary, Ayurveda-tatvasandeeepika on Sushrutaa Samhita of Acharya Sushrutaa, Sharira Sthan, Garbhavkranti Sharira, Chapter 3, Verse 19-21, Chaukhamba Sanskrita Sansthan Varanasi., 2010; 32: 1921.
11. Pandit Kashi Nath Shastri, Dr. Gorakh Nath Chaturvedi (Editors), Charaka Samhita of Agnivesha, Sharira Sthana, Mahati Garbhavkranti Sharira, Chapter 4, Verse 18; Chaukhamba Bhartiya Academy Varanasi, 2011; 874.
12. Pandit Kashi Nath Shastri, Dr. Gorakh Nath Chaturvedi (Editors), Charaka Samhita of Agnivesha, Sharira Sthana, Jatisutriya Sharira, Chapter 8, Verse 30; Chaukhamba Bhartiya Academy Varanasi, 2011; 935.
13. Pandit Kashi Nath Shastri, Dr. Gorakh Nath Chaturvedi (Editors), Charaka Samhita of Agnivesha, Sharira Sthana, Mahati Garbhavkranti Sharira, Chapter 4, Verse 27; Chaukhamba Bhartiya Academy Varanasi, 2011; 877.
14. Pandit Kashi Nath Shastri, Dr. Gorakh Nath Chaturvedi (Editors), Charaka Samhita of Agnivesha, Sharira Sthana, Jatisutriya Sharira, Chapter 8, Verse 9-33; Chaukhamba Bhartiya Academy Varanasi, 2011; 921-937.
15. Kaviraj Dr.Ambika Datta Shastri (Hindi Commentator); Commentary, Ayurveda-tatvasandeeepika on Sushrutaa Samhita of Acharya Sushrutaa, Sharira Sthan, Garbhini Vyakarana Sharira, Chapter 10, Verse 2-6, Chaukhamba Sanskrita Sansthan Varanasi, 2010; 98.
16. Pandit Kashi Nath Shastri, Dr. Gorakh Nath Chaturvedi (Editors), Charaka Samhita of Agnivesha, Chikitsa Sthana, Vtavyadhi Chikitsa Adhyaya, Chapter 28, Verse 54; Chaukhamba Bhartiya Academy Varanasi., 2011; 787.



17. Prof. Siddhinandan Mishra (Editor), Bhaisajya Ratnavali of Kaviraj Shri Yogendra Nath Sen, Vata vyadhi rogadohikaar, Chapter; Chaukhamba Subharti Prakashan Varanasi., 2007; 26(542): 566-567.
18. Mishra L.C., Scientific basis for Ayurvedic therapies, chapter., 2004; 26: 456.CRC Press, LLC, Florida,