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Case Study

MANAGEMENT OF MIXED CEREBRAL PALSY THROUGH AYURVEDA

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ABSTRACT

Cerebral Palsy (CP) is the most common cause of developmental and functional disabilities in children. A non-progressive neuromotor condition of posture and movement. Cerebral palsy (CP) is described as the result of improper development of injury to the brain's motor control centers. Due to its multifactorial nature and vast range of clinical symptoms, it cannot be associated with a particular Ayurvedic disease or condition. According to *Vagbhaṭa* it is classified in the categories of *Sahaja* (hereditary), *Garbhaja* (congenital) and *Jataja* (psychosomatic) disorders. There is no known "cure" for any of the several forms and subtypes of cerebral palsy. A three-year-old male child was reported to pediatric OPD of Sanjeevani Ayurveda Hospital, Dr. S. R. Rajasthan Ayurved University, Jodhpur, Rajasthan, with complaints of mixed cerebral palsy. The case was taken up and aimed to assess the effectiveness of the Ayurvedic management method in enhancing the child's quality of life, improving or enhancing his functional capacity to become dependent and facilitating early rehabilitation to avoid subsequent complications.

INTRODUCTION

Cerebral palsy (CP) is the most common cause of developmental and functional disabilities in children. The term refers to "a group of non-progressive but frequently fluctuating motor impairment syndromes which are secondary to brain abnormalities or lesions arising in early stages of its development". The global prevalence of CP varies from 1.5 to 2.5 per 1000 live births.[1] Disturbances in sensation, perception, cognition, communication and behavior frequently accompany motor impairments in cerebral palsy patients.[2] There are four forms of cerebral palsy: spastic, dyskinetic, ataxic and mixed. With an incidence of between 70% and 80% spastic CP accounts for a significant share of CP in all forms. There isn't a known cure for any of the various forms and subtypes of cerebral palsy (CP). Autologous stem cell activation therapy to increase blood vessel size, support neuronal growth and fortify the immune system, stem cell transplantation procedure, Botulinum toxin type A injection[3], baclofen intrathecal injection[4], selective dorsal rhizotomy[5], orthotic devices such as ankle-foot orthoses, hyperbaric oxygen therapy, neuroplasticity are more recent developments in CP management that are being tested.

Classic Ayurvedic texts do not provide a one-to-one link with CP. In the classics, certain situations are found discretely at several locations, that show an overlap of CP symptoms such as *Phakka* (a kind of nutritional disorder), *Pangulya* (locomotor disorders), *Mukatava* (dumbness), *Jadatva* (mental disorders), *Ekangroga*(monoplegia), *Sarvangaroga* (quadriplegia), *Paksaghata* (hemiparesis), *Paksavadha* (hemiplegia) etc under the group of umbrellas of *Vatavyadhi* (neurological disorders).

These conditions are linked to certain circumstances as their causes such as inappropriate *Ritu* (ovulation cycle), *Kshetra* (uterus), *Ambu* (amniotic fluid and fetal nutrition) and *Bija* (sperm and ovum)[6], *Dauhrdavamanana*[7] (neglect of urges during bi-cardiac stage of pregnant women), presence of *Garbhopaghatakarbhava* (normal requisites for growth and development of fetus)[8], and improper *Garbhini paricharya* (antenatal regimen)[9] may have unfavorable consequences on the developing foetus, impending its healthy growth and development and increasing the risk of several illnesses, abnormalities,

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and even death. Considering everything said above, we have developed an Ayurvedic therapy protocol to improve the condition of CP patients. For the publication of this case report written informed consent was obtained from the patient's mother/ guardian.

Basic Information of the Patient

Three years old male child came with his parents in the OPD of Kaumarbhritya, Sanjeevani Ayurved Hospital, Jodhpur, Rajasthan, India, with the chief complaints unable to sit for a long time from 6 months, walks with cross legs from 6 months, difficulty in standing without support from 1 year, speaks ma, pa etc monosyllables words since 1 year along with drooling of excessive saliva from mouth. Parents visited to many paediatric neurologists but no relief was obtained in the condition of baby. In a ray of hope, they approached the OPD of Kaumarbhritya in Sanjeevani Ayurved Hospital.

Past History: The child had neonatal seizures for 5 days immediately after birth and had pneumonia at the age of 1.5 month.

Family History: No such type of history found in family.

Birth History

Antenatal: At 4 months of pregnancy, mother slipped from 2 or 3 stairs and abdominal pain started at 6 months of pregnancy.

Natal: Full term vacuum delivery (36 weeks) vaginal delivery, baby was having delayed cry by 10 minutes at birth. His birth weight was 2500 grams.

Postnatal history: There were h/o seizures at birth (for 5 days) and pneumonia at 1.5 month of age.

Development History

Table 1: Showing delay in Gross Motor Milestone

Milestone	Normal range	Attained age
Neck Holding	3 months	3 years
Rolls over	5 months	3.5 years
Sits in tripod fashion	6 months	3.5 years
Sits without support	8 months	Absent
Stands with support	9 months	4 years
Walks with support	10 months	Absent
Stand without support	12 months	Absent
Walks alone	15 months	Absent
Run	18 months	Absent
Climb up and downstairs	2 years	Absent
Rides tricycle	3 years	Absent

Table 2: Showing delay in Fine Motor Milestones

Milestone	Normal range	Attained age
Bidextrous reach	4 months	3.5 years
Unidextrous reach	6 months	3.8 years
Immature pincer grasp	9 months	4 years
Mature pincer grasp	12 months	Absent
Imitates scribbling, tower of 2 block	15 months	Absent
Tower of 3 blocks	18 months	Absent
Tower of 6 block	2 years	Absent
Tower of 9 blocks, copies circle	3 years	Absent
Copies cross, bridge with blocks	4 years	Absent
Copies triangle, gate with blocks	5 years	Absent

Table 3: Showing delay in Social Milestones

Milestone	Normal range	Attained age
Social smile	2 months	2-3 months
Recognizes mother	3 months	3-4 months
Recognizes stranger	6 months	7-8 months
Waves bye-bye	9 months	3 years
Comes when called	12 months	4 years
Copies parents task	18 months	Absent
Ask for food, drink and toilet	2 years	Absent
Knows name, age and gender	3 years	Absent
Plays in group	4 years	Absent
Help in house hold works	5 years	Absent

Table 4: Showing delay in Language Milestone

Milestone	Normal range	Attained age
Alerts to sound	1 months	1-2 months
Coos	3 months	1 years
Monosyllables	6 months	2.5 years
Bisyllables	9 months	2.5 years
1-2 words with meaning	12 months	3.5 years
8-10 words vocabulary	18 months	3.5 years
2-3 word sentence	2 years	4 years
Knows name, age and gender	3 years	Absent
Says song or poem, tell stories	4 years	Absent
Ask meaning of words	5 years	Absent

Immunization History- Vaccination has been given to the child as per the schedule.

Personal History

Feeding history-The child was breast feed for 2 years and he was weaned at the age of 1 year.

Dietary habits- Patient was totally dependent for food intake, and was eating only homemade semi solid food due to lack of coordination in deglutition. Appetite was good. Diet was dominant in *Madhura Rasa* (sweet diet).

Sleep- Sound sleeps of 2-3 hrs in day and 8 hrs in night.

Bladder- Child urinates 7-8 times/day and the color of the urine was pale yellow and had no any odour.

Bowel- Child passes stool twice a day and consistency were semisolid.

General Examination

Child was conscious, well oriented to time, place and person, moderately built and moderately nourished weighing 12kg, height 90cm, no signs of pallor, icterus, cyanosis, lymphadenopathy and edema.

Vitals were found normal.

Asthavidha- Pariksha

Naḍi (pulse) - *Vatadhikatridoṣaja.*

Mutra (urine) - There was no complaint with regard to *Mūtra,* frequency and color was normal.

Mala (stool) - Semisolid and passes twice a day.

Jihva (Tongue) - Normal

Shabda (speech)- Not learnt properly and was able to speak only monosyllables words till the age of 2 years (monosyllables should have been learnt by 9 months of age).

Sparsha (touch)- Hard and dry (due to hypertonia and spasticity).

Dṛika (eyes) - Squint in right eye.

Akiṛti (appearance) - Lean

Systematic Examination

Respiratory system, cardio vascular system, gastro intestinal system and genitourinary system did not have any significant clinical findings.

Central Nervous System

Higher Mental Function- Child was alert, well oriented to time, place and person, without any hallucination, delusion and illusion. The speech was dysarthria.

Motor system examination

Muscle tone was assessed by Modified Ashworth Scale. Grade spasticity - 0 to 4 ordinal scale.

Muscle Power- Assessed by Modified Medical Research Council Scale (MRC-Scale) and grade is 0 to 5.

Table 5: Muscle Tone- assessed by Modified Ashworth Scale

Extremity	Right	Left
Upper Limb	4 (Hypertonia)	4 (Hypertonia)
Lower Limb	4 (Hypertonia)	4 (Hypertonia)

Table 6: Muscle Power- assessed by Modified Medical Research Council Scale

Extremity	Right	Left
Upper Limb	0 (no movement)	0 (no movement)
Lower Limb	0 (no movement)	0 (no movement)

Reflexes

Superficial reflex/Cutaneous reflex- Glabellar tab reflex, corneal/conjunctival reflex, palatal reflex, abdominal reflex was increased.

Deep tendon reflex- Bilaterally biceps reflex, triceps reflex, knee reflex/patella reflex, ankle reflex/ Achilles reflex was found brisk. Bilaterally ankle clonus was present bilaterally along with brisk positive Babinski reflex.

Sensory System Examination

Superficial sensation- Touch, pain, temp, two-point discrimination was present.

Deep sensation- Proprioception, deep muscle pain, vibration was present.

Investigations- Periventricular leukomalacia (PVL) was reported in the previous MRI. All other hematological examination like CBC, KFT, LFT and Serum Vitamin D_3 were found within normal limits.

Diagnosis- *Sannipataja Mastikaghata*[Mixed Cerebral Palsy (Spastic Diplegic and Dystonic)].

Management

Treatment was advised for four months. During which powder combination of *Ashwagandha Churna*, *Saraswata Churna*, *Godanti Bhasma*, *Brahmi Vati (Swarna), Rasraj Rasa* and *Yograj Guggulu* were given twice daily before food with honey, Syp. Brento and Syp. Calcidab twice daily after food were given. *Kalyanka Avleha* with *Kalyanka Ghrita* and honey were given, *Syp. Triphla* was given at bed time internally. Externally *Abhyanga* with *Mahanarayan Taila* and *Prasarini Taila* was given. *Matrabasti* with *Ksheerbala Taila* was advised for 21 days. A gap of 9 days was given between 2 sittings, during which oral medications were continued. *Shiro Pichu* with *Brahmi Ghrita* was given in second sitting along with previous procedures. In third sitting *Shiro Pichu* was replaced by *Shirobasti* and rest procedures were same as previous sitting. In fourth sitting *Shiro Basti* was replaced with *Shirodhara, Shashtik Shali Pinda Swedana* along with *Abhyanga* was done. Total duration of the treatment was 120 days.

Table 7: Administration of Internal Medicine with dose and duration

S.No.	Formulation	Dose	Duration
1.	*Ashwaganda Churna* *Saraswata Churna* *Godanti Bhasma* *Brahmi Vati (Swarna)* *Rasraj Rasa* *Yograj Guggulu*	1gm 500mg 150mg 60mg 10mg 150mg (twice a day before food with honey)	4 Months
2.	*Syp. Brento*	1 ½ TSF twice daily after meal	
3.	*Syp. Calcidab*	1 ½ TSF twice daily after meal	
4.	*Kalyanka avleha* *Brahmi Ghrita* Honey	2.5gm 1.25gm 1 TSF (Mix all and take twice a day)	
5.	*Syp. Triphla*	2 TSF HS	

Table 8: Administration of *Panchakarma* Procedures with duration

Sitting	Procedure	Duration	Medication use
1st	*Abhyanga* *Matra Basti*	21 days	*Mahanarayan Taila + Prasarini Taila* *Ksheer Bala Taila*
2nd	*Abhyanga* *Matra Basti* *Shiro Pichu*	31-52 days (21 days)	*Mahanarayan Taila + Prasarini Taila* *Ksheer Bala Taila* *Brahmi Ghrita*
3rd	*Abhyanga* *Matra Basti* *Shirobasti*	62-83 days (21 days)	*Mahanarayan Taila + Prasarini Taila* *Ksheer Bala Taila* *Brahmi Ghrita + Tila Taila*
4th	*Abhyanga* *Shastik Shali Swedan* *Matra Basti* *Shirodhara*	93-114 days (21 days)	*Mahanarayan Taila + Prasarini Taila* *Ksheer Bala Taila* *Brahmi Taila + Tila Taila*

RESULT

Table 9: Showing Muscle Tone after treatment assessed by Modified Ashworth Scale

Extremity	Right	Left
Upper Limb	0 (Normal)	0 (Normal)
Lower Limb	1 (Slight increase)	1 (Slight increase)

Table 10: Showing Muscle Power after treatment assessed by MMRC scale

Extremity	Right	Left
Upper Limb	4 (Movement possible against gravity as well as some resistance	4 (Movement possible against gravity as well as some resistance
Lower Limb	3 (Movement possible with gravity but can't move against resistance)	3 (Movement possible with gravity but can't move against resistance)

Table 11: Showing Probable Pathophysiology and its management

Rog Prakriti	***Samprapti Ghatka***	***Samprapti Vighatana***
Dosha	*Vatadhiktridosha*	*Basti*
Dushya	*Rakta, Mamsa, Asthi, Sandhi, Snayu, Kandara*	*Abhyanga, Swedana*
Srotas	*Rasa-Rakta* and *Majjavaha*	*Medhya* drugs
Agni	*Mandya*	*Deepan, Pachan* drugs
Srotodusti	*Sanga* (obstruction)	*Srotoshodhan* by *Basti*
Udhabhavstan	*Pakwashaya* (being a *Vatavyadhi*)	*Basti*
Vyaktasthana	*Sarvang*	*Sarvang Snehan* and *Swedana*
Roga	Spastic cerebral palsy	*Vatavyadhi Chikitsa (Snehan, Swedana, Basti, Sneha pan)*
Sadhya/Asadhyata	*Krichhasadhya*	Long term treatment protocol

DISCUSSION

Both internal and external interventions are necessary for the treatment of cerebral palsy. After examining the case, it was found out that the *Panchavayus* the *Prana, Udana, Vyana, Saman* and *Apana*, the *Pachaka, Alochaka* and *Sadhka Pitta* and the *Shleshka*, *Tarpaka* and *Avalambhka Kapha* were responsible for the development of the illness. It was also observed that the *Rasa, Rakta, Mansa*, *Medh, Asthi* and *Majja dhatus* were involved. According to his presentation, the treatment approach was focused on treating him holistically that considered that how the CP diagnosis affected the function of his lower extremities. The treatment plan that was used which primarily consist of *Bhaya* and *Abhyantra Snehan*

followed by *Swedan, Basti* and *Brahngana* therapies. External procedures started with *Snehana, Swedana* procedures which are prerequisites of any process of *Shodhana*. *Abhyanga* is regarded as one of the most effective methods for reducing *Vata* because it works through cutaneous manipulation and *Vayu* is located in *Sparshendriya*, it is considered most effective treatment for lowering *Vata. Abhyanga* operates via central as well as local procedures. *Swedana* acts as *Shrotosangha Vighatana* and relieves joint stiffness since it possesses qualities like *Stambhana, Sandhicheshtakar, Shrotosiddhikar* and *Kapha-Vata Nirodhkara*.[10]

The heat and pressure of *Shashtika Shali Pinda Swedana*, in addition with the cow's milk from *Balamoola Kwath*, enhance local blood circulation, reduce spasticity, boost tendon flexibility, lessen pain, and nourish the muscles to fend off atrophy and other detrimental effects.[11] The body's *Bala, Varna, Harsha, Mardavatva*, and *Snehan* are all encouraged by *Basti*.[12] The mainstay of Ayurvedic treatment is called "*Basti Chikitsa*". Additionally, it is regarded as *Ardha Chikitsa*, or half treatment.

Matrabasti is a variant of *Anuvasana Basti* in which a tiny amount of ghee or oil is administered via the rectal channel. It is *Vatarogahara, Balya,* and *Brimhana.*

It acts on *Moola Sthana (Pakwashya)* which regulates *Vata* throughout the body. *Shirodhara-Shirodhara* may have a calming effect on seizures, cognitive decline, and CP-related behavioral issues like anxiety and hyperactivity by controlling the release of different neurotransmitters and hormones.

Ashwagandha Churna- Research has demonstrated that *W. somnifera* extracts have a wide range of beneficial properties, such as reducing inflammation and oxidative stress and improving memory and cognitive function.[13]

Saraswata Churna- Includes plants such as *Acorus calamus, Saussurea lappa, Withania somnifera, Carum carvi, Convolvulus pluricaulis, Bacopa monnieri, Zingiber officinale,* and others that have been shown to have psychotrophic effects. The anxiolytic and antidepressant properties of *Saraswata Churna* have been demonstrated in an experiment.

Brahmi Vati- The ingredients of *Brahmi vati* are predominantly of *Tikta, Katu* and *Kashaya rasa*; *Snigdha* and *Laghu guna*; *Ushnavirya; Katu* and *Madhur vipaka; Vata-Kapha Shamaka* and *Medhya Prabhava.* Saponins are the main active constituents of extract of Bacopa monnieri (*Brahmi*) which are responsible for its pharmacological actions like nootropic, neuroprotective etc.[14]

Suvarana Bhasma has *Madhur Rasa* and *Snigdha Guna* which balance *Chala Guna* of *Vayu Mahabhoota*. It improves grasping, comprehension and memory. It also gives stability (*Sthirtavakrita*).

After analyzing the mode of action of various *Panchakarma* procedures it has been clear that *Panchakarma* along with internal medications has significant role in the management of CP.[15]

CONCLUSION

Children with cerebral palsy benefit greatly from the chosen Ayurvedic therapy technique because it reduces symptoms and signs and consequently, the degree of disability. Significant results were obtained by the end of the 120-day therapy period. The child began to play, transferring little objects with both hands. The degree of spasticity decreased and normal movement was noted. The child could speak in phrases. It was previously thought that neurons do not regenerate or repair following an injury, but the novel theory of neuroplasticity suggests that the central nervous system (CNS) can replace injured neurons with new ones through axonal sprouting.[16] This progressing patient also provides additional evidence in favor of neuroplasticity.

CONCLUSION

Based on the case study's findings, it could be drawn the conclusion that Ayurvedic *Panchakarma* therapy with appropriate internal medicine could be effective in the management of mixed cerebral palsy and significantly enhance quality of life.

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