

# Effectiveness of Balapanchamrita Yoga and Panchakarma based Procedures in the Management of Children with Cerebral Palsy; A Single Arm Prospective Clinical Trial

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**Abstract:** Cerebral palsy is one of the most serious disease in developing child that's occur due to insult of developing brain during pregnancy, at the time of delivery and after the birth of child up to 2 years of age. The world-wide incidence of cerebral palsy is 2.5/1000 live births and 3/1000 live births in India. CP is manifested as developmental delay, movement disorder, visual disability, hearing disability, in-coordination of speech and involvement of cognitive function with or without seizures. The symptoms of CP are showing the similarity with some Ayurvedic diseases such as Vatavyadhi, Phakka, Ekanga Roga, Sarvanga Roga, Pakshaghata, Janampravrita Dosha and Dauhritya-avamanana etc., In present scenario, any medical science and pathies are not give the complete remission or cure of CP. But Ayurvedic Panchakarma procedures show the satisfactory result in the management of CP. So that 15 patient of cerebral palsy were treated with three course of treatment (each course consist of 3 days Udvartana, 14 days Sarvanga Abhyanga with Ksheerabala taila and Nadi Swedana with Eranda patra kwatha and 7 days of Matra Basti with Ksheerabala taila from 8<sup>th</sup> days of Sarvanga Abhyanga and Nadi Swedana) with an interval of 14 days along with internal medication of Balapanchamrita Yoga with the aim to reduce the spasticity, improvement in range of motion of joints and quality of life of CP Child. The total 81 days treatment were shown the significant result in the management of Cerebral palsy.

**Keywords:** Cerebral palsy, Neuromotor disorder, Vatavyadhi, Matra Basti

## 1. Introduction

Population based studies from around the world reported prevalence of cerebral palsy ranging from 1.5-4 per 1000 live births <sup>[1]</sup>. Cerebral palsy is characterised by persistent primitive reflexes, abnormal muscle tone, or motor development and coordination; and also associated with secondary co-morbidities like 28% cases having vision problems, 23-56% cases having learning disabilities <sup>[2]</sup>; and also 31% to 88% cases having dysarthria <sup>[3]</sup>. Spastic diplegic CP is characterized by normal cognition because the lesion is in the periventricular white matter, i.e. sparing the cortical grey matter. While in spastic quadriplegic CP have greater degree of mental retardation than children with spastic hemiplegia. The spasticity and movement disorders are the core symptoms of CP, difficulties with thinking, learning, feeling, communication and behaviour often co-occur. The treatment were plan as per the condition of patient, severity of disease and associated complications- Physical therapy, Occupational therapy, Speech therapy, Medication(ant-cholinergic drugs etc) and advanced management includes Autologous stem cell activation treatment in order to expand the blood vessels and nourish the neurons, stem cell transplantation procedure, Botulinum toxin type A injection, Selective dorsal rhizotomy (SDR), Orthotic devices such as ankle-foot orthoses (AFOs), Hyperbaric oxygen therapy (HBOT), Neuroplasticity, cord blood therapy, Hippotherapy, conductive education and Recreational therapy are the newer advancements under trial in the management of CP. Vitiated Vata Dosha is responsible for the symptoms of cerebral palsy. So Vata pacify measures play important role in the management of CP. Treatment of Vata Dosha consists of a variety of treatment modalities including Snehana, Swedana, Basti etc Panchkarma procedures. It improves

gross as well as fine motor functions, provides nourishment, improves overall general condition and quality of life in children with CP. As per preventive aspect and the management in CP, there are no satisfactory criteria developed till date for the complete cure.

**Aim and Objective:** To assess the effect of Panchakarma procedure with oral administration of *Balapanchamrita Yoga* in Spasticity and Range of motion/movement in CP Child.

## 2. Material & Method

The study was conducted on 15 clinically diagnosed and confirmed patients of Cerebral palsy from OPD/IPD, department of kaumarabhritya AIIA, New Delhi.

### A. Inclusion criteria

- Diagnosed case of Cerebral palsy and age between 1-12 years of either sex.
- Parents submitting written consent to participate in the study.

### B. Exclusion criteria

- Progressive neurological disorder, severe intractable epilepsy as co-morbidity, congenital disorders/anomalies.
- Children had received Botox (last 1yr) or had undergone Phenol block injection or intrathecal Baclofen medication, Recent orthopedic surgery/casting/splint and Fixed contractures.
- Caregiver not willing to sign the informed consent form.

**C. Criteria of Assessments**

- Modified Ashworth Scale [4]
- Gross Motor Functional Manual Scale [5]
- Quality of Life [6]

**D. Treatment Protocol**

A total 81 days of treatment was given to the patient in the form of three courses with interval of 15 days between each course of treatment.

- *Udwartana*: 3days with *Tilapinyaka churna* for 15-20 min.
- *Sarvanga Abhyanga*: 14 days with *Ksheerabala taila* for 20 min.
- *Nadi Swedana*: 14 days with *Eranda patra kwath*.
- *Matra Basti*: 7 days with *Ksheerabala taila* (start from 8<sup>th</sup> day of *Sarvanga Abhyanga* and *Nadi Swedana*).

- Ingredients: *Haritaki (Terminalia chebula Retz.)*, *Pippali (Piper longum Linn.)*, *Shunthi (Zingiber officiale Rosc.)*, *Misreya (Foeniculum vulgate Mill.)* and *Hingu (Ferula narthex Boiss.)*.
- Dosage form- *Churna*
- *Anupana- Madhu*
- Dose & Duration – Dose as per age of child for 81 days

$$\text{Dosage: } \left( \frac{\text{Adult dose} * \text{Age of child (in years)}}{12 + \text{Age in years}} \right)$$

- Time of Administration- Twice a day, Morning and Evening.

Institutional Ethical Clearance (IEC) and Clinical Trial Registry of India (CTRI) were done before initiating the clinical study [IEC Number: **AIIA/2018/PG-98**; CTRI Registration number: **CTRI/2019/06/019645**, **trial registered prospectively**]

**Internal medication:** *Balapanchamrita Yoga* [7]

**Table 1.1:** Showing Total duration and course of the clinical study

Course	<i>Udwartana</i>	<i>Sarvanga Abhyanga &amp; Nadi Swedana</i>	<i>Matra Basti</i>	Total
Ist	3 days with <i>Tilapinyaka churna</i>	14 days with <i>Ksheerabala taila</i> And <i>Eranda patra kwatha</i>	7 days with <i>Ksheerabala taila</i>	17 days
GAP				15 days
2 <sup>nd</sup>	3 days with <i>Tilapinyaka churna</i>	14 days with <i>Ksheerabala taila</i> And <i>Eranda patra kwatha</i>	7 days with <i>Ksheerabala taila</i>	17 days
GAP				15 days
3 <sup>rd</sup>	3 days with <i>Tilapinyaka churna</i>	14 days with <i>Ksheerabala taila</i> And <i>Eranda patra kwatha</i>	7 days with <i>Ksheerabala taila</i>	17 days
Total	81 days Panchakarma procedure with <i>Balapanchamrita Yoga</i> orally			

**3. Observation and Results**

In the present study, the total 15 patient were registered and completed the 3 course of treatment. An equal number of patients i.e., 73.33% were from age group of 6-12 years. The majority of patients were male [60%] and 93.33% of total patients presented with history of delayed cry. Further, Meconium aspiration was reported in 26.67% cases, seizures in 13.33% and Jaundice in 26.67% cases. 80% of the total

patients required hospitalization and 66.67% patients were needed resuscitation. 40% of the total patients were not achieved bowel and 46.67% not achieved bladder control. 86.67% patients presented with spastic type of CP, 06.67% Dyskinetic and 06.67% mixed CP. Among the Spastic CP, 53.33% patients were of Spastic diplegic CP and 46.67% patients Spastic quadriplegic CP. 86.67% patients had speech problems and problems with eyes and vision were seen in 20% patients.

**Table 1.2:** Showing effect of therapy on GMFM Scale (N=15)

Assessment parameters	Mean score		Mean (BT-AT)	SD +/-	S.Er.	Df	T	P value
	BT	AT						
Lying & Rolling	59.42	89.53	30.11	25.89	6.68	14	4.50	<0.000
Sitting	48.55	74.77	27.22	17.06	4.40	14	6.18	<0.000
Crawling & Kneeling	27.98	51.11	23.17	14.99	3.87	14	5.98	<0.000
Standing	12.1	37.77	25.66	16.16	4.17	14	6.15	<0.000
Walking & Running	10	28.33	18.33	16.07	4.15	14	4.41	<0.001

**Table 1.3:** Showing effect of therapy on QOL Scale(N=15)

Assessment parameters	Mean score		Mean (BT-AT)	SD +/-	S.Er.	Df	T	P value
	BT	AT						
Family & Friends	65.38	74.12	8.73	3.67	0.94	14	9.19	<0.000
Participation	30.92	37.96	7.03	5.23	1.35	14	5.20	<0.000
Communication	55.3	64.19	8.88	6.23	1.60	14	5.52	<0.000
Health	51.89	61.66	9.76	2.96	0.76	14	12.7	<0.000
Special equipment	52.58	61.47	8.88	10.45	2.70	14	3.29	<0.005
Pain & Bother	72.91	58.33	14.58	5.98	1.54	14	9.43	<0.000
Final question	61.62	51.55	10.07	2.03	0.52	14	19.18	<0.000
Access	57.28	65.67	8.39	3.76	0.97	14	8.64	<0.000
Your health	80.88	86.21	5.33	3.54	0.91	14	5.82	<0.000

Table showing 1.4 Effect of therapy on MAS (N=15)

Assessment parameters	Mean score		Mean (BT-AT)	SD +/-	S.Er.	Df	T	P value
	BT	AT						
Elbow Rt.	2.1	1.1	1.00	0.53	0.13	14	7.24	<0.000
Elbow Lt.	2.1	1.1	1.00	0.53	0.13	14	7.24	<0.000
Wrist	2.06	1.13	0.93	0.49	0.12	14	7.29	<0.000
Fingers	2.06	1.13	0.93	0.49	0.12	14	7.29	<0.000
Thumb	2.06	1.13	0.93	0.49	0.12	14	7.29	<0.000
Hamstring Rt.	2.96	1.63	1.33	0.48	0.12	14	10.58	<0.000
Hamstring Lt.	2.96	1.63	1.33	0.48	0.12	14	10.58	<0.000
Quadriceps Rt.	2.96	1.63	1.33	0.48	0.12	14	10.58	<0.000
Quadriceps Lt.	2.96	1.63	1.33	0.48	0.12	14	10.58	<0.000
Gastrocnemius	2.96	1.63	1.33	0.48	0.12	14	10.58	<0.000
Soleus	2.96	1.63	1.33	0.48	0.12	14	10.58	<0.000

Table 1.5: Showing Overall response of the therapy

Parameters	MAS		GMFM		QOL	
	No.	%	No.	%	No.	%
No response (Less than 5%)	0	0	0	0	0	0
Mild response –I (5%-25%)	7	46.67	9	60	15	100
Mild response –II (25%-50%)	8	53.33	6	40	0	0
Moderate response (50%-75%)	0	0	0	0	0	0
Excellent response (75%-100%)	0	0	0	0	0	0

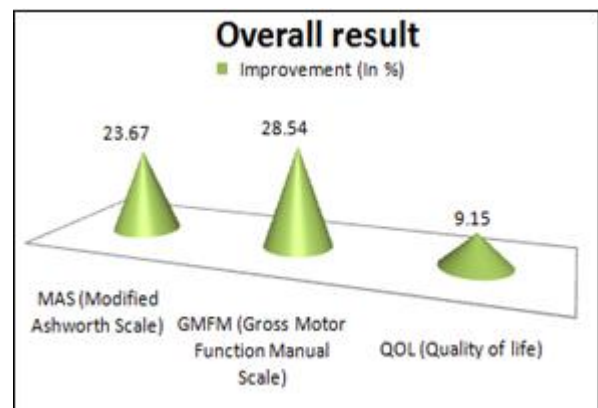
Table 1.6: Showing Overall Clinical improvement of the therapy

S.No.	Parameter	Improvement (In %)
1.	MAS (Modified Ashworth Scale)	23.67
2.	GMFM (Gross Motor Function Manual Scale)	28.54
3.	QOL (Quality of life)	9.15

#### 4. Discussion

Spasticity is the one of the most important reason for orthopaedic disability in CP Child. After a long period, spasticity gets to convert the bone contracture. Unfortunately, the complete cure of disease in any medical science till date is not available. As per the symptoms of cerebral palsy, it can be compare with some condition in Ayurvedic texts such as *Vata* predominant state. So the Ayurvedic management of cerebral palsy is mainly target on *Vata Dosha*. In this present study *Udwartana* seems to be beneficial effect in reducing the spasticity in CP child and it is a prime procedure in 'Amavastha' (collected waste product inside the body) or 'Kapha Dosha Aadhikyaavastha'<sup>[8]</sup>. *Udwartana* with finely grinded powder of *Tilapinyaka churna* clear orifices of hair follicles, improves lymphatic circulation and improves Transdermal Drug Delivery (TDD). Thus *Udwartana* is helpful to mobilized absorbed drug potency to the target site by increased circulation. *Abhyanga* directly works on *Vata* to bring it back to normalcy. When *vata* comes to normalcy development of milestones will become normal<sup>[9]</sup>. *Abhyanga* stimulate sensory nerve ending of the skin and gives abundant sensory inputs to the cortical and different parts of the brain. And also reduces muscle tone, improves muscle bulk and power in CP child<sup>[10]</sup>. A study reported that in hemiparetic subjects the H-reflex was depressed during both continuous and intermittent tendon pressure. Intermittent pressure is found more effective than continuous pressure. *Swedana* relieves heaviness, stiffness and coldness in the body parts<sup>[11]</sup>. *Ksheerabala Taila* has a *Vatahara* property and help in the alleviation of vitiated

*Vata Dosha*. *Basti* not only helps in expelling the vitiated *dosha's* from the *pakwashaya* but also helps in taking control over the vitiated *Vata*, and operates the functions of the whole body from *Pakwashaya*. Thus the *Basti* treatment gains much important in the management of *Vata*. In this study, 46.67% patients has shown mild response I and 53.33% patients with mild response II on Modified Ashworth scale. 60% patients have show mild response I and 40% patients with mild response II on Gross Motor Function Manual Scale. 100% patients have shown mild response I on Quality of life scale.



#### 5. Conclusion

The overall comparative clinical improvement in the present study have shown 23.67% on Modified Ashworth scale, 28.54% on Gross Motor Function Manual Scale, 9.15% on Quality of life scale. The improvement in condition of CP patients is occurring due to combined approach of *Udwartana*, *Abhyanga*, *Nadi Swedana* and *Matra Basti*. All procedures play an important role in the management of CP and also provide the platform for next procedures to do better in every step. Thus the Panchakarma procedure shows the significant effect in the management of CP.

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