A Birds Eye View on Different Ayurvedic Treatment Modalities in Cerebral Palsy in Children

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ABSTRACT

Introduction: Cerebral palsy (CP) is a permanent, non-progressive, and occasionally evolving disorder of tone, movement, or posture caused by a change to the developing brain, which may be due to birth asphyxia, trauma, infection, or prematurity in antenatal, perinatal, or post-natal periods.

Material and Methods: A systematic review of the literature available was carried out on PubMed, Ayush Research Portal, Dhara, and Scopus regarding Ayurvedic intervention in the management of CP.

Results: The treatment program for a child with spasticity may include Ayurvedic drugs, allied health therapy, and exercise. Ayurveda recommends multiple treatment options for CP. Out of these treatment options herbal drugs, Panchakarma therapies, etc. are most commended for this disease.

Discussion: The present paper reviewed various clinical studies to ascertain the efficacies of these modalities and found that Ayurveda can efficiently manage CP along with its associated condition by improving movement, reducing spasticity, and strengthening the muscles.

Conclusion: The current review provides motivating evidence for the usage of herbal treatment in CP and further research utilizes robust available methodology.

1. INTRODUCTION

Cerebral palsy (CP) is a motor function disorder caused by a defect in the developing brain, which may be due to birth asphyxia, trauma, infection, or prematurity in antenatal, perinatal, or postnatal periods. In developing nations like India, the incidence of CP is approximately 3/1,000 live births. This has not altered recently despite better antenatal care and public health.[1] Although CP begins in childhood, it impacts the individual’s whole life course as well as the health-care system. Identifying appropriate interventions to alleviate disability throughout the life of a person with CP is urgent.[2] The male gender was classified as a risk factor for CP. Epilepsy has been shown to be the most commonly associated comorbidity.[3] CP is predominantly a mobility issue, but many children who have it also have additional disabilities that may lower their quality of life and shorten their life span. The most prevalent mobility difficulty in 80% of kids with CP is spasticity.[4]

As there is an association of sīras (central nervous system), CP can be taken into consideration as Siromarmabhhighaata jata vatavyadhi and the clinical symptoms are in the form of sarvaangavaata (involvement of the whole body) paksha-vadha (hemiplegic), pangu (diplegic). The treatment of Siromarmabhhighaata is mentioned as Abhyanga, Swedana, and Upanaha.[5]

The aim of the present review is to find out different Ayurvedic treatment modalities available in CP in the pediatric population.

1.1. Clinical Risk Factors for CP during Pregnancy

Much scientific evidence shows that CP is often associated with longstanding intrauterine pathologies, such as genetic changes and
possible environmental factors such as diseases and infections in the body, intrauterine growth restriction (IUGR), post-partum hemorrhage, and cervical tension, and threatened miscarriage.[6]

1.2. Premature Birth
The incidence of CP in pre-mature babies is higher than in term babies. Pre-mature birth is an important risk factor for CP.[7]

1.3. Coexisting Congenital Anomalies
The prevalence of congenital anomalies in children with CP is much higher than in the general population and most are cerebral, such as schizencephaly and hydrocephaly.[8]

1.4. Intrauterine Infection
Some causes include damage after perinatal infection (for example, maternal infection during pregnancy and/or labor that affects the fetus and brain at birth).[9]

1.5. Abnormal Fetal Inflammatory Response and Thrombophilia
Another possible cause and mechanism of CP is abnormalities in fetuses and newborns.[10] An excessive or abnormal increase in cytokines after infection (due to genetic predisposition or mutation) and the voluntary emergence of an inflammatory response on the part of the body’s immune system or toxins cause an autoimmune attack on the fetus or fetus. The baby’s nerves are developing. The immature brain of pre-mature infants is vulnerable to the effects of pro-inflammatory cytokines.[11]

1.6. Intrauterine Growth Restriction
In particular, spastic CP increases with the degree of fetal growth restriction.[12] Our large epidemiological study of Australian children and normal controls revealed IUGR to be a significant risk factor for CP.[13]

1.7. Multiple Pregnancy
The risk of two IVF twins is more than 4 times greater (9.5/1000), which is another reason why transfer from family to child is supported.[14]

1.8. Tight Nuchal Cord at Delivery
Potentially chronic asphyxiating conditions, chiefly a tight nuchal cord, increase the risk of spastic quadripelite CP. A large population-based study noted that a tight umbilical cord around the fetal neck, requiring cutting before delivery of the shoulders, or a true umbilical knot increased the risk of spastic quadripelite 18-fold.[15]

1.9. Placental Pathology
Chorioamnionitis, funisitis, and in particular necrotizing, funisitis all are evidence of infection predating labor and are associated in all epidemiological studies with an increased risk of CP.[16]

1.10. Viral Infection in Pregnancy
Studies using polymerase chain reaction techniques on neonatal blood spots from CP cases and controls show increased CP risk after both Cytomegalovirus and Epstein-Barr virus infections during pregnancy.[17]

1.11. Genetic Causes of CP
Genetic causes have long been suspected because of the link with congenital malformations and increased risk in consanguineous families and monozgyotic twins.[18]

According to the kind of movement issue that is present (spastic, athetoid, ataxic, or mixed), the body parts affected (hemiplegia, diplegia, or quadriplegia), or the functions impacted (mild, moderate, severe, or profound), CP is frequently categorized. Spastic CP comes in many types depending on the body parts affected.

In spastic hemiplegia or hemiparesis, unilateral side of the body is affected by the arm, hand, and occasionally the leg. While intellect is often normal, children of this kind may experience delays in their ability to speak. Spastic diplegia or diparesis causes less damage to the arms and face in people of this kind, who often suffer muscular stiffness in the legs. Language proficiency and intelligence are typically average. Spastic quadriplegia or quadriparesis is the most severe kind of CP, characterized by a floppy, or weak, neck and extreme rigidity in the limbs and legs. Spastic quadripel�ics are typically unable to walk and frequently have speech difficulties. Intellectual or developmental disability of this kind can range from mild to severe.

Dyskinetic CP is a kind that entails erratic hand movements, feet, arms, or legs that are sluggish and out of control. Some kids may drool or make faces due to hyperactive facial and tongue muscles. People with this kind frequently struggle to walk or sit upright. Intellectual difficulties are typically absent in people with dyskinetic CP.

Ataxic CP has an impact on balance and depth perception. When walking or performing rapid or precise actions such as writing, buttoning a shirt, or reaching for a book, people with ataxic CP have difficulty.

In mixed types of CP, the symptoms overlap with those of the other types which are spastic, dyskinesia, and ataxic.

2. MATERIALS AND METHODS
An electronic search was carried out on PubMed, Ayush Research Portal, Dhara, and Scopus regarding Ayurvedic intervention in the management of CP. All collected data were analyzed specifically for clinical studies, and case studies regarding treatment protocol available in CP. Keywords used for database analysis were “Cerebral Palsy,” with combined terminologies of “herbal drug/medicines,” “Ayurvedic drugs,” “Medicinal plants,” “Herbs,” “integrative therapy,” “botanical herbs,” and other specific Latin or Sanskrit names of Ayurvedic drugs.

3. RESULTS AND DISCUSSION
Comprehensive assessment by clinical efficacy review of medicinal plants is a quite convoluted task, as herbal preparations have manifold chemical compositions. Drug action in Ayurvedic treatment is dependent on many factors, that is, genetic value differences; different types of environmental factors; various qualities of soil; airborne vectors; used plant parts; and method of preparation, and prakruti.

There is developing attention to the utilization of natural herbal medications to treat cerebral paralysis, rather than utilizing chemical-based synthetic formulations across the globe. Keeping in view, the current scenario of the problem in society due to changes in lifestyle and to improve the quality of life of a person suffering from CP, the present critical review has been planned. Although, the duration
of the different treatment modalities is long but the current review recommends that there are a lot of clinical studies, which reveal that Ayurvedic interventions undoubtedly improve the quality of life of the patients suffering from CP.

4. CONCLUSION
CP is a chronic motor disability influencing a significant pediatric population and costing to a great extent on country’s GDP. Ayurveda can give elective, conservative, economical, and more successful treatment choices for children afflicted by CP. The current review provides motivating evidence for the usage of herbal treatment in CP and further research utilizes robust available methodology. These will make the way for the next step in the field of Ayurvedic management of CP.

5. ACKNOWLEDGMENTS
We would like to acknowledge Prof. (Dr.) Ashutosh Gupta, Principal, Govt. Ayurvedic Medical College Akhnoor Jammu for his support and encouragement.

6. AUTHORS’ CONTRIBUTIONS
All the authors contributed equally in the design and execution of the article.

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8. ETHICAL APPROVALS
This study is not required ethical clearance as it is a review study.

9. CONFLICTS OF INTEREST
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10. DATA AVAILABILITY
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REFERENCES


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<td>1.</td>
<td>Shailaja et al.</td>
<td>Efficacy of Samvardhana Ghrita orally and by Matrabasti in motor disabilities of CP in children</td>
<td>2013</td>
<td>Patients of age 2-10 years were randomly distributed into two groups. Group A (Samvardhana ghrita orally) was treated with 5 g of Samvardhana ghrita with Madhu as Anupama twice daily for 48 days. In Group B, 20 mL of Samvardhana ghrita as matrabasti after local Abhyanga with Moorchita Taila and local Svedana with Nadiśveda method</td>
<td>Both oral administration and the basti route of Samvardhana Ghrita have promising results in managing motor disabilities of CP in children.</td>
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<td>2.</td>
<td>Palande and Ojha</td>
<td>Ayurveda management of spasticity in children with CP: A randomized controlled trial</td>
<td>2017</td>
<td>Cases were randomly divided into three groups each comprising 10 patients. Group A was administered the Trial Drug (Shishu Kalyan Ghrita) and Panchakarma procedure (Abhyanga &amp; Shashtishali Pinda Sweda). In Group B, Kala Basti (Anuvasana Basti: Dhanvantar taila and Asthapana Basti: Dashmool Kwath) and Panchakarma procedure, and in Group C Physiotherapy (Control group) were administered. Assessment was done by Ashworth scale for spasticity.</td>
<td>Ayurveda management with Shishu Kalyan Ghrita and Panchakarma procedures including Abhyanga with Dashmool Taila, Shashtishali Pinda Sveda has proved to be a better, safe, and cost-effective treatment modality for improving the spasticity.</td>
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<td>3.</td>
<td>Kumar and Ojha</td>
<td>Ayurvedic management of spastic CP: A case study.</td>
<td>2018</td>
<td>Abhyanga with Balaashvaghandhadi Taila for 20 min followed by 15 days. Shashtika Shali Pinda Sveda for 20 min followed by 15 days. Matra Basti with Balaashvaghandhadi Taila followed by 15 days. Samshaman Aushadha (an oral drug for 30 days) Aavindaasava – 10 ml with equal water after food twice a day Brahmi ghrita - 10 ml with hot water before food twice a day. Three such courses were done with the interval of 15 days.</td>
<td>Panchakarma procedures such as Abhyanga, Shashtika Shali Pinda Sveda, and Matra Basti along with Shamana Aushadi gave moderate improvement in growth, development reducing spasticity &amp; also helps the patient to improve the quality of life (QOL).</td>
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<td>4.</td>
<td>Kanzode et al.</td>
<td>A case study on Ayurvedic management of CP with chaturbhadra kalpa basti</td>
<td>2016</td>
<td>5 days Udvartana (dry powder massage) followed by 5 days Abhyanga (massage with sudation) followed by 12 days Chaturbhadra kalpa Basti, such courses were done with an interval of 14 days. The total duration of therapy was 94 days.</td>
<td>Panchakarma procedures as well as appropriate internal medication can show a better improvement in a CP child and can help to reduce the extent of dependency on parents and to improve QOL.</td>
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<td>5.</td>
<td>Bhinde</td>
<td>A case study on the Ayurvedic management of CP</td>
<td>2015</td>
<td>Five days Udvartana followed by 5 days massage with sudation followed by 12 days Caturbhadra Kalpa Basti. Three such courses were done with the interval of 14 days. Udvartana With barley powder and horse gram powder for 20 min (5 days). Abhyanga With Balataila for 20 min followed by sudation for 20 min (5 days). Caturbhadra Kalpa Basti has been clearly indicated as free from complications. This protocol of Basti administration includes four Sneha Bastis to start with, followed by four āsthāpana Basti and four Anuvāsana Bastis. Anuvāsana Basti Thirty milliliter; lukewarm Balataila. Āsthāpana Basti One hundred and twenty milliliters; as per the classical reference of Madhutailika Basti. Internal medicine Astāṅgaghṛta, throughout the treatment schedule, except the days on which Basti was given. Anupāna for internal medicine: Lukewarm water Dosage: 2.5 g once/day.</td>
<td>Ayurvedic Pañcakarma therapy along with appropriate internal medication can do a lot for the improvement in QOL.</td>
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<td>6.</td>
<td>Shailaja et al.</td>
<td>Clinical study on the efficacy of Rajayapana Basti (RB) and Baladi Yoga in motor disabilities of CP in children</td>
<td>2014</td>
<td>Pediatric patients satisfying diagnostic criteria and between the age group of 2–10 years were included and randomly divided into two groups. In RB with Baladi group, patients were treated with Mustadi Rajayapana Basti for 8 days, followed by oral administration of Baladi Yoga with honey and ghee for 60 days. Before administering Basti, patients were subjected to Sarvanga Abhyanga and Sastikashali Pinda Sveda. In the control group, patients were given tablets of Godhuma Choorna for 60 days. Before administering the placebo tablet, the patients of the control group were given Basti with lukewarm water for 8 days. Mustadi RB along with Baladi Yoga provided a significant improvement in all the parameters and has promising results in managing motor disabilities of CP in children.</td>
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<td>7.</td>
<td>Bhinde et al.</td>
<td>Management of spastic CP through multiple Ayurveda treatment modalities</td>
<td>2014</td>
<td>Patients were registered and treated with 5 days of Udvartana, 5 days of Abhyanga followed by Sarvanga Swedana, and then 8 days of Yoga Basti. The same course of treatment has been repeated for 3 times with an interval of 14 days. Ashtanga Ghrita was given during the whole procedure as internal medication. Results of treatment were assessed with anthropometrical measurement, developmental milestone, Modified Ashworth Scale, spasm scale, reflex scale, and muscle power grading. A multisystem approach is needed to improve the condition of the patient. Panchakarma along with internal medication should be given to improve all the facets of spastic CP. Yoga Basti acts by their own mode of action and can be used freely for such disease conditions.</td>
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<td>8.</td>
<td>Niraj and Varsha</td>
<td>A Case Study on the Ayurvedic Management of Spastic CP Due to Birth Asphyxia</td>
<td>2019</td>
<td>The total period of treatment was 93 days, in which 5 days of Abhyanga (Massage) with Nadi swedana (steam kettle Sudation), 5 days of Abhyanga (Massage) with Shashti Shali Pinda Swedana (a type of Sudation) and then 7 days of Matra Vasti (Enema by Medicated oil in small dose) by Ksheera Bala Taila; this schedule of treatment was given three times with a gap of 14 days. Vacha mula (Root of Acorus calamus) and Samvardhana Ghrita were given as internal medication during the total course of treatment. The treatment protocol of oral medication with Panchakarma delivered better results in CP patients, especially improving anthropometric data (weight, height, chest circumference), delaying milestones (walking and language), reducing spasticity, and improving Quality of Life (QOL).</td>
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<td>9.</td>
<td>Shailaja et al.</td>
<td>Exploratory Study on the Ayurvedic Therapeutic Management of CP in Children at a Tertiary Care Hospital of Karnataka, India</td>
<td>2014</td>
<td>The study group received Mustadi Rajayapana Basti (enema with herbal decoction) and Baladi Yoga (a poly-herbo-mineral formulation), while the placebo group received Godhuma Vati (a tablet prepared with wheat powder) and saline water as an enema Mustadi Rajayapana Basti and Baladi Yoga proved to be more supportive in improving motor activities and gross behavioral pattern. Further clinical trials are required to evaluate and validate the maximum effect of the combination therapy in a large sample with repetition of the courses for longer duration.</td>
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<td>10.</td>
<td>Rajput and Patni</td>
<td>Randomized Clinical Trial to Evaluate the Efficacy of Ashtamangal Ghrita Oral and Nasya in the Management of CP</td>
<td>2020</td>
<td>Children with physical and mental developmental disabilities of age group 01–10 years of either sex were randomly divided into two groups, group A received Ashtamangal ghrita (orally) - 1 mL/kg body weight in two divided doses for 3 months and Group B received Pratimarsh Nasya with Ashtamangal ghrita – two drops in each nostril 2 times a day for 3 months Clinical efficacy of both Ashtamangal ghrita orally and as nasya on various parameters of CP showed that both were effective, safe, and comparable.</td>
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<td>11.</td>
<td>Rathi et al.</td>
<td>Comparative Efficacy of Therapeutic Panchakarma Procedures Alternate Brimhan-Rakshan Versus only Brimhan in Children with CP</td>
<td>2023</td>
<td>Patients fulfilling the diagnostic criteria were included and randomly distributed into two groups of 10 each. Group A was given Brimhan procedures such as Talapothichil/Shiropichu, Annalepan, Pindswed, Tailadhara and MatraBasti for 3 days followed by Rakshan procedures such as Talapothichil/Shirolepan, Udgharshan, Kwathdhara, Patrapottali, and Niruh Basti for next 3 days alternate 5 cycles starting and end with Brimhan in total 15 days and 15 days follow-up for 3 consecutive months. Group B received only Brimhan procedures for the same pattern and duration. Three such courses were administered to both Groups with an interval of 15 days along with necessary symptomatic treatment, physiotherapy and occupational therapy</td>
<td>Multiple interventions are essential in the management of CP. Alternate Brimhan-Rakshan Panchakarma procedures are more beneficial with physiotherapy and occupational therapy as CP has Vata-Kapha Dosha dominance. [29]</td>
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<td>12.</td>
<td>Arun Raj et al.</td>
<td>Comparative clinical study to assess the effectiveness of Salavana Upanaha Sweda with and without Parisheka on spasticity in children with CP</td>
<td>2022</td>
<td>Diagnosed cases of Spastic CP were selected for the study based on the diagnostic criteria and inclusion criteria, later divided into two groups—Parisheka Upanaha group (PUG) and Upanaha group (UG). The subjects in PUG were administered both Parisheka and Upanaha while those in UG with Upanaha only. The duration of the study was 90 days, in consecutive 3 sittings of 15 days each with a gap of another 15 days</td>
<td>Even though both groups were found to be effective in reducing Spasticity based on objective and subjective parameters, a better effect was seen in Upanaha along with the Parisheka group when compared to the Upanaha alone group. [30]</td>
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