REVIEW ARTICLE

Evidence-based study of the effect of Ayurveda management of cerebral palsy in children: A systematic review

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Abstract

Child disability is a major concern for any nation. Childhood comorbidity is not only a challenge for parents but also a big concern for pediatricians. The motor disorder of cerebral palsy (CP) is often accompanied by disturbances of sensation, perception, cognition and has multifactorial etiology. *Vata* is dominant *Dosha* which plays a major role in childhood disabilities, so the treatment plan should be *Vata Shamana* like *Phakka Roga Chikitsa*, and *Shiromarmabhighata* can be used. The use of *Rasayanas* with *Medhya* drugs (intellect promoting) characteristics will enhance the child's mental and physical development. This will go a long way toward curing and preventing impairments. To search and reassess the effects of different CP therapy techniques in Ayurveda. Analysis of published clinical data in a systematic manner to determine the efficacy and safety of *Vatavyadhi* versus Ayurvedic therapy protocols for CP. The study examined case reports, non-randomized controlled trials (RCTs), and RCTs on the treatment of CP in Ayurveda. They were located using directories of open-access publications as well as databases for Ayurvedic research and medical journals, including MEDLINE, SCOPUS, and Web of Science. Hand-searching was conducted with pre-established search criteria. Search results were only returned for articles up to April 2021. The selection of studies was based on CP symptomatology. The study ID, design, sample size, duration, interventions, results, and outcomes were used to document and retrieve the data. Using the tools at hand, the quality and bias risk were assessed. We did not try quantitative synthesis because we were only interested in systematic review. 20 of the 44 screened records met the predetermined criterion. Two research on *Nasya* (medicine administered through the nose), 8 studies on *Udavartana* (application of dry powder to the skin), 9 studies on *Shasthi Shali Pinda SwedaSwedana* (hot fomentation with rice cooked in milk) and 16 studies concentrating on *Basti* (therapeutic enema) as the main management strategy is among the most frequently used therapies. The outcomes were divided into *Bhaya chikitsa* (external procedures), *Shamana* (palliative medicines), and *Shodhana* (purification medicines). Overall investigations reveal a significant improvement in the gradation index-measured subjective characteristics. Better alleviation was seen when panchakarma therapy was paired with oral medication. The study's findings led to a significant improvement in spasticity and muscle power and helped to maintain a better quality of life, which is widely appreciated.

Key words: Cerebral palsy, *Medhya*, morbidity, *Tridoshas*, *Vatavyadhi*

INTRODUCTION

Cerebral palsy is a disease that is explained as non-progressive damage that affects the developing brain. Cerebral palsy (CP), the most common cause of childhood disability, is characterized by abnormal tone, posture, and mobility, as well as sensorial, perceptual, cognitive, communicative, and behavioral abnormalities. The development of motor function and body posture before, during, or soon after birth is impacted by CP, a diverse permanent neurological condition brought on by damage or abnormality in the growing central nervous system. Numerous prenatal, natal, and postnatal etiological

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factors can cause CP, which has many different symptoms. CP, however, is primarily caused by preterm delivery. CP affects roughly 2.5 out of every 1000 live births worldwide; however, the abnormality varies with age and severity as well as the disorder's qualitative and quantitative repercussions, such as hemiplegia and diplegia.[1] In India, there are three cases of CP for every 1000 live births and each year in the US, approximately 10,000 infants receive a CP diagnosis, with 1200–1500 of those diagnoses occurring in preschoolers.[2]

The major motor syndrome (physiologically/qualitative) of CP is defined clinically as either Spastic, Dyskinetic, Choreoathetoid, Dystonic, Ataxic, Hypotonic, or Mixed. Three frequent features of CP include abnormalities in body movement or posture, static brain abnormalities, and acquired brain disorders (early in life). These traits do not, however, indicate how severe are the movement problems.

There are five types of paralysis that make up the topographic (quantitative) classification of CP: quadriplegia, hemiplegia, diplegia, monoplegia, and triplegia. Since the afflicted areas substantially overlap, monoplegia and triplegia are uncommon. The majority of cases of CP (70–75%) are spastic, while hypotonic and ataxic cases are extremely uncommon.

According to traditional Ayurvedic theory, CP can be classified as a *Vata pradhana vyadhi.* There are a few ailments listed in Ayurvedic scriptures that have some similarities to CP like *Phakka* (a type of nutritional disorder), *Pangulya* (locomotor disorders), *Mukatva* (dumbness), *Jadatva* (mental disorders), *Ekanga roga* (monoplegia), *Sarvanga roga* (quadriplegia), *Pakshaghata* (hemiparesis) and *Pakshavadha* (hemiplegia), etc. In classic texts, conditions like "*Avarana janya vata vyadhi* or *Kaphavrita vata*" can be used to describe spastic CP. The majority of *Vata vyadhi* symptoms are very similar to those of CP. Some writers claim that CP might be referred to as "*Shiro-Marmabhigathaja Bala Vata Vyadhi*" in Ayurveda.[3]

In Ayurveda, *Medhya Rasayanas* like *Brahmi* (*Baccopa monnieri*), *Mandookaparni* (*Centella asiatica*), *Shankhapushi* (*Convolvulus pluricaulis*), etc, which are supposed to act on mental faculty mainly on the brain can have a substantial role in correcting the damage in the brain as supported by several studies. Sajgotra *et al*., used various scales, such as the psychological well-being scale, Barthel's index, Positive and negative affect schedule, and FIM scale, to perform an experimental study with practical sampling for CP and cerebro-vascular accident patients. According to this study, *Brahmi* helps patients with behavioral issues and CP with their cognitive function and motor control, which affects the child's capacity to explore, communicate, learn, and become independent.[4]

Aqueous extract of the whole plant (200 mg/kg for 14 days) was used in a different study on *Mandookparni* by Dr. Kumar and Gupta., which revealed an improvement in learning and memory. *C. asiatica* is used for its cognitive properties as a brain tonic, in the treatment of mental disorders, and as a memory-enhancing agent.[5]

The studies mentioned above on *Brahmi* and *Mandookparni* revealed that Ayurvedic medicines have good potential for treating mental disorders with improvement in domains like behavior, cognition, motor activity, etc. In addition, various *Panchakarma* procedures such as *Udwartana* (medicated dry powder massage), *Sarvaanga abhyanga* (full body massage with medicated oil), *Sastika Shali Pind Sweda* (Steamed *Shali* rice with medicated milk), *Nadi Sweda* (steam bath), and *Basti* (medicated oil and decoction enemas) are found to be significantly effective in the management of CP in children.[6]

MATERIALS AND METHODS

Eligibility Criteria

Ayurvedic interventions, procedures, and physiotherapy with *Yoga* were used in the study group. The studies included cases of age group 6 months–12 years of any gender, based on the symptomatology of CP. Review studies, conceptual studies, newsletters, book chapters, supplemental articles, conference reports, abstracts, and papers without the complete text were excluded from the study.

The efficacy and security of outcome measures were assessed by:

- Efficacy: Improvement in CP symptoms and/or objective criteria and improving quality of life (QOL).
- Safety: Serious adverse occurrence, adverse consequence, or treatment discontinuation as a result of therapy or treatment discomfort.

Information Sources

Search techniques for locating research were categorized under the topics of

- Electronic searches: AYUSH Research Portal, digital helpline for ayurveda research abstracts, MEDLINE via PubMed and CAM on PubMed, PubMed Central, NISCAIR online periodicals repository, Cochrane Complementary Medicine trial register, directory of open access journals and Google Scholar were among the databases we searched for Ayurveda
- Hand searching: A hand search was conducted utilizing the Ayurveda research database, thesis works, conference proceedings, bulletins, bibliographies, and mementos for those items which were not listed in any digital database.

Search Strategy

The outcome of a database search using the technique population, intervention, control/comparison, and outcome is shown in Table 1. Following the PICOS search, MeSH phrases,

Table 1: PICO strategy for selection

Population	Intervention	Comparison/Control	Outcomes
Bal-Pakshaghatah, *Vat-vyadhi*, *Akshepaka*, *Manovehsrotodushti*, Global Developmental Delay, Mental Retardation	Ayurvedic interventions, Ayurvedic therapy, Ayurvedic treatment, *Rasaushadhi, Panchkarma, Shodhana, Shamana*, *Sarvanga Abhyanga, Udvartana, Yoga Basti, Nadi Svedana, Nasya, Shirodhara, Yoga,* Physiotherapy	Placebo, no treatment, non and/or Ayurveda therapy, non-Ayurveda treatment, non-Ayurveda interventions.	Anthropometrical records, Modified Ashworth scale, Muscle power grading scale, MACS scale, GMFM, DASII, QOL, ROM.

MACS: Manual ability classification system, GMFM: Gross motor function measure, DASII: Developmental assessment scales for Indian infants, QOL: Quality of life scale, ROM: Range of motion, PICO: Population, intervention, control/comparison and outcome

keywords, and filters were used, including the following: AND clinical trial OR case series OR case studies OR non-randomized controlled trails (RCTs) OR RCT trial. Search results were restricted to materials released through April 2021.

Selection Process

The research looked at case studies, case series, non RCTs, and RCTs. The preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) were used to conduct this review.[7] The title and abstract were independently reviewed by the initial author to determine eligibility and clarity. The first author studied the entire report of every study that might be pertinent to determine if it satisfied the inclusion and exclusion criteria. After that, we looked closely for duplicate publications by NKO, AM and MNSM using the same data. Each author (HR, MNSM, AM, and NKO) listed the studies that were eliminated, along with a justification for doing so. Additionally reviewed were the reference lists, bibliographies, and systematic reviews that were not included. There was a total of 24 studies that were found to be ineligible for inclusion. Any discrepancies in this were settled through discussion by a fourth investigator (NKO).

Data Collection Process

The eligibility of the following processes, titles, and abstracts' collected data was examined. For the purpose of determining inclusion and exclusion criteria, the entire report of pertinent research was examined. Studies that were excluded were listed along with the grounds for their rejection. In addition, the bibliographies of reference lists and excluded studies were all reviewed. All clinical results and different reporting formats were included. The study id, design, sample size, timeframe, interventions, dose, results, and outcomes were used to identify the data.

Data Items

Using domains including study id, design, sample size, duration, dose schedule, intervention, and outcome measures, data were gathered. The results were then summarized in a data extraction form and calculated. Two reviewers (HR and MNSM) elaborated on a data extraction form and calculated the data from the included studies after summarizing it. The third and fourth researchers oversaw any differences (AM and NKO). The authors state that they did not receive any financing.

Study Risk of Bias (ROB) Assessment

The ROB in the included studies ROB for non-RCTs (NRCTs) was evaluated using the tool ROB in non-randomized studies of interventions (ROBINS-I).[8] We independently assessed the potential for bias in the relevant studies.

Effect Measures

The time and effect assessments ranged from 3 months to 3 years or more due to the inclusion of various therapy modalities and regimens.

Synthesis Methods

This systematic review's main objective was to report and synthesize the most recent research on Ayurvedic treatments for CP. They were thus evaluated utilizing efficacy and safety results. Because of the disparity in study methodologies, a meta-analysis was not undertaken.

Reporting Bias Assessment

The ROB resulting from omitted results in synthesis was assessed using the information provided in the published trial report.

Certainty Assessment

To reduce bias, each chosen paper was individually evaluated by all reviewers for quality before the discussion. The statement transparent reporting of evaluation with

nonrandomized designs (TREND) was used to examine the specifics of the reported data, awarding two points for complete item reporting, one point for partial reporting, and no points for "No" reporting.[9] This article does not apply the consolidated standards of reporting trials statement - 2010 criteria since there was no randomized controlled study involved.[10]

RESULTS

Study Selection

Out of the 44 studies identified through the database, 24 were excluded as they were not matching the inclusion criteria of the study. A total of 20 eligible studies were selected for qualitative synthesis. These twenty studies comprised 9 NRCTs and 11 case study. The study settings are summarized as per "PRISMA-P in Figure 1.

Study Characteristics

Table 2 elaborates on a brief discussion of the listed research.

ROB in Studies

The ROBINS-I tool was used to evaluate bias risk. According to this evaluation, none of the publications included information on confounding variables and missing data; instead, the majority of the studies had serious and critical ROB, with just a small number providing information on low and moderate bias. The assessment domains were not properly addressed, and some improper reports were made. For instance, there was improper reporting of the status of interventions and co-interventions, observed deviations from intended interventions, and a complete lack of information regarding confounding factors, missing data, and frequently a hazy description of how outcomes were measured. They were therefore classified as critical and serious

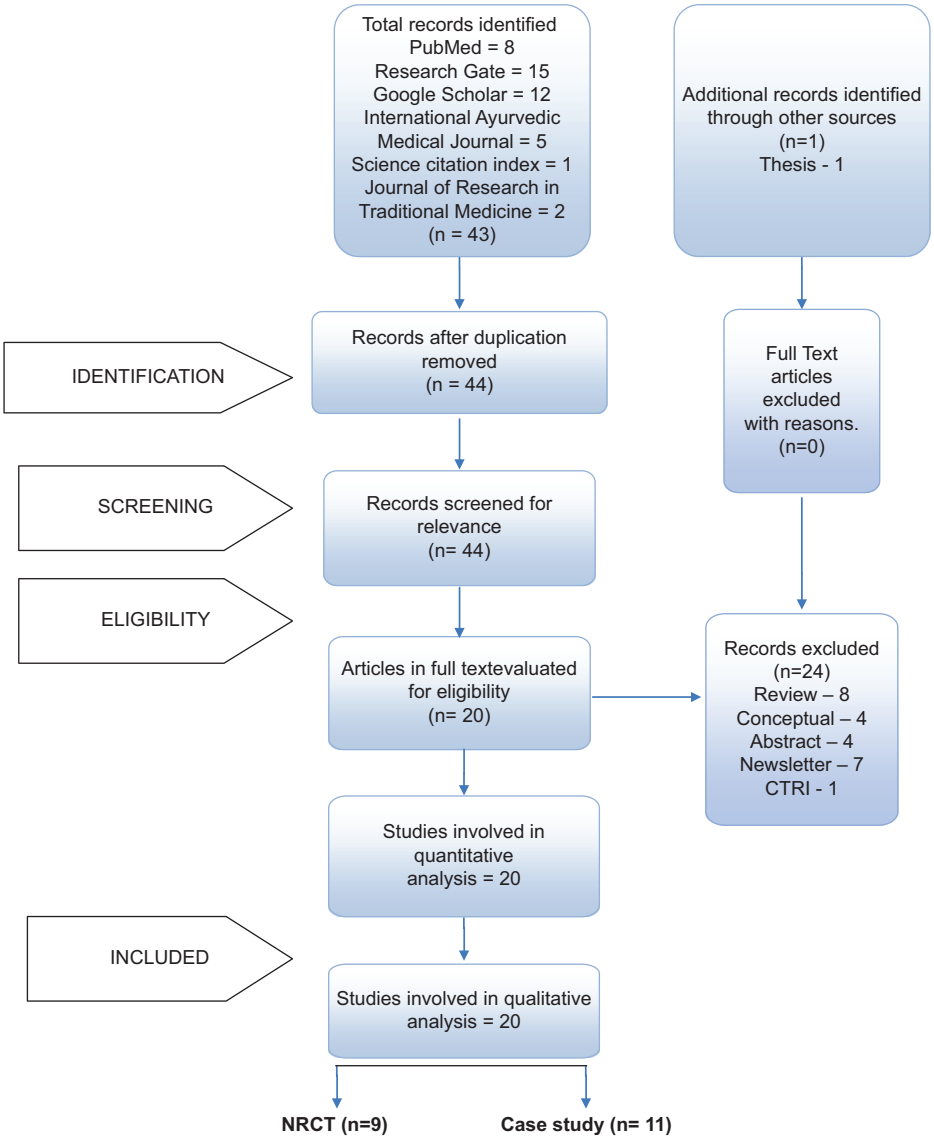

Figure 1: Study flow diagram

Table 2: Previous researches done on Ayurvedic management of cerebral palsy

S. No	Study ID	Sample size	Study period	Study design	Study intervention	Dosage schedule	Outcome measures
1.	Ghuse *et al.*, 2016[11]	8, Group A 7, Group B	86 days	Open clinical trial	Group A 1. *Udvartana*: *Yava* and *Kulatthachurna* for 20 min for 5 days. 2. *Abhyanga*: *Bala Taila* for 20 min and *NadiSwedana*for 20 min for 5 days 3. Days of *Shastika Shali Pinda Sweda* 4. 16 days of interval Group B 1. *Udvartana*: *Yava* and *Kulatthachurna* for 20 min for 5 days. 2. *Abhyanga*: *Bala Taila* for20 min and*NadiSwedana* for 20 min for 5 days 3. *Yoga Basti:* For *Aasthapana* (decoction based) *Madhutailika Basti* and for *Anuvasana* (oil based) *Bala Taila* for 8 days. 4. 16 days of interval *Medhya churna* in both the group throughout the treatment schedule.	*Medhya Churna* Dose: 750 mg–7 g ROA: Oral TOA: In two divided doses	1. CDC graded motor milestones, and appropriate scoring scales for fine motor, language, and personal and social milestones were prepared. 2. The Ashworth Scale for evaluating spasticity, 3. Muscle power grading scale, 4. An assessment of upper limb function using the MACS, and 5. A score for ADL.
2.	Sonam *et al.*, 2019[12]	Single (20)	90 days	Open clinical trial	1. *Udvartana- Tila Pinyaka churna* for 10–15 min (for 3 days) 2. *Sarvanga Abhyanga-Ksheerbala Taila* for 10–20 min (for 14 days) 3. *Nadi swedana- Vataharapatra Kwath* 5–10 min (for 14 days) 4. *Matra Basti- Ksheerbala Taila* for 7 days 5. Orally- *Abhaya Ghrita* for 90 days	*Abhaya Ghrita* Dose: 1–3 g ROA: Orally TOA: In two divided doses.	1. GMFM, 2. CP-QOL.
3.	Niraj and Varsha 2019[13]	Case study	93 days	-	1. *Abhyanga:* Equal amount of *Bala Taila* and *Mahanarayan Taila* for 20 min (for 5 days) 2. *Swedana: Shashti Shali Pinda Swedana* and *Nadi Swedana for* 20 min (for 5 days) 3. *Matra Vasti: Ksheera Bala Taila* 10 mL for 7 days. Oral: *Vacha mula* (for 93 days) and *Samvardhana Ghrita* (for 93 days)	*Samvardhana Ghrita* Dose: 1–3 g ROA: Orally TOA: In two divided doses. *Vacha-mula* Dose: Rubbed 40 times above a stone in 5 mL of cow'smilk and given with 5 mL of honey. ROA: Orally TOA: Twice a day.	1. Anthropometrical measurements, 2. Modified ashworth scale, 3. Muscle power grading scale, and 4. MACS scale.

(Contd...)

Table 2: *(Continued)*

S. No	Study ID	Sample size	Study period	Study design	Study intervention	Dosage schedule	Outcome measures
4.	Bhinde 2015[14]	Case study	94 days	-	*1. Udvartana* with Barley powder and horse gram powder for 20 min (for 5 days) 2. *Abhyanga- Bala Taila*for 20 min (for 5 days) *3. Caturbhadra Kalpa Basti:* for 12 days duration in each course of treatment *Four Asthapana Basti (Madhutailika Basti) – 120 mL* Four *Anuva-sana Basti* (*Balataila*) – 30 mL Orally: *Ashtangaghrita* 2.5 g/day	*Ashtangaghrita* Dose: 2.5 g ROA: Orally TOA: Once in a day	1. Growth parameters and goniometric evolution to determine the motion range (ROM), 2. Ashworth scale, 3. A scale for measuring spasm intensity, and 4. A categorization system for measuring the function of the upper limb.
5.	Sharma and Yadav 2018[15]	Case study	3 months	-	*1. Deepan* and *Pachana chikitsa* with *Chitrakadi vati* and *Trikatu churna* 1 g+H*aritaki churna* 1 g with lukewarm water twice for 10 days *2. Udvartana* with *Istika churna* (Brick powder) with T*ila taila* 10 min (for 7 days) 3. *Abhyanga: Bala Aswagadha Taila* 20 min (for 15 days) *4. Swedana: Shashti shali pinda Sweda* for 20 min (for 15 days) *5. Anuvasan Basti: Majja siddha basti* 30 mL (for 10 days) 6. *Nasya: Shatabindu taila* 2–2 drops (for 10 days) 7. *Shirodhara: Bala-Ashawagandha Taila* 15 min (for 10 days) 8. *Shamana-Chikitsa: Aswagandha churna* 2 g+ D*hatupostic churna* 1 g B.D. with Milk *Pipalyadhasawa* 5 mL B.D. *Dwatrinsata kwath* 50 mL. B.D 9. Yoga: *Pshchimotanasana* and P*ranayam* 30 min daily. Exercise: Forward bending, pulling the rope etc.	*Aswagandha churna and Dhatupostic churna* DOSE: 3 g with Milk ROA: Orally TOA: Twice a day *Pipalyadhasawa* – DOSE: 5 mL ROA: Orally TOA: Twice a day *Dwatrinsata kwath* DOSE: 5 mL ROA: Orally TOA: Twice a day	1. Anthropometrical evaluations 2. Developmental milestones, 3. The MAS; 4. The MACS; and 5. The Deep Tendon Reflex Scale.

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Table 2: *(Continued)*

S. No	Study ID	Sample size	Study period	Study design	Study intervention	Dosage schedule	Outcome measures
6.	Sohini and Anirudhan 2017[16]	Case study	28 days	-	1. *Udwarthana: Kolakulathadi choornam* for 5 days 2. *Abhyngam*: *Mahanarayanathailam* (7 days) 3. *Sarvanga Dhara: Ashtavargam Ksheera Kashayam* (7 days) 4. *Siropichu: Dhanwantharam Thailam* (28 days) *5. Upanaha Swedam: Vathahara* drugs (28 days). 6. *Kayasekam: Rasathailam* (7 days) *7. Mridu virechanam: Eranda sukumaram* 10 mL at bed time (7 days). *8. Shashtika lepam* with *Aja mamsam* for 7 days 9. *Mathravasti: Dhanwantharam Mezhukupakam*- 30 mL (7 days). 10. Physiotherapy 11. Orally: *Rajnyadi choorna* – 5 g BD before food *Aswagandharishta* – 10 mL BD after food. *Sahacharadi Thailam* 21 *avarthy* – six drops with milk OD after food. *Kalyanavaleha choorna* – 5 g with honey OD after food.	*Rajnyadi choorna* – 5 g BD before food *Aswagandharishta* – 10 mL BD after food intake. *Sahacharadi Thailam* 21 *avarthy* – six drops with milk OD after food. *Kalyanavaleha choorna* – 5 g with honey OD after food.	1. The range of motion of the joints (ROM) was used to measure spasticity, 2. The developmental assessment measures for Indian newborns were used to measure motor and mental development (DASII).
7.	Mamidi and Gupta 2015[17]	Case study Case- I 4 year, Male with Cerebral palsy Case- II 3.5-year, Male with Cerebral palsy	1 month	-	Case- I *1. Udwartana* with *Kola kuluthadi choornam* *2. Sarvanga Abhyanga*with *Bala Taila*followed by *Bashpa Sweda* 3. *Brahmi Ghrita*- 5 mL BD, before food with hot water. Case - II *1. Udwartana* with *Kola kuluthadi choornam* *2. Sarvanga Abhyanga* with *Maha masha taila* 3. *Bashpa sweda* and *Anda pinda Sweda* 4. *Matra Basti* with *Dhanwantaram tailam* - 20 mL *5. Maha kalyanaka ghritam*- 5 mL BD before food with hot water. 6. *Saraswatarishtam* with gold – 3 mL BD, after food	*Brahmi Ghrita*- 5 mL BD, before food with hot water. *Maha kalyanaka ghritam*- 5 mL BD, after food with hot water and *Saraswatarishtam* (gold) – 3 mL BD, after food	1. GMFM.

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Table 2: *(Continued)*

S. No	Study ID	Sample size	Study period	Study design	Study intervention	Dosage schedule	Outcome measures
8.	Arbar *et al.*, 2019[18]	Case study	21 days	-	1. For 1st 3 days – a. *Koshta Shodhana* with *Gandharvahastadi Taila* HS (20 mL), b. *Krimihara*treatment -*Vidangarishta* 5 mL TID, c. *Udvarthana* with *Triphala choorna*+*Shashtika-shalee choorna* (20 min) d. *Nadisweda* with *Dhashamoola Kashaya* (10 min) 2. For Next 7 Days – a. *Sarwanga Abhyanga* with *Dhanwantara Taila* (20 min), b. *Shastika Shalli Pinda Sweda* (20 min), c. *Matra basti* with *Ksheera Bala Taila* (15 mL) and c. *Godhumadi Upanaha lepa* (Both lower limbs) d. Physiotherapy and Speech therapy (10 days).	For 1st 3 days A. *Koshta Shodhana* with *Gandharvahastadi Taila* HS (20 mL), B. *Vidangarishta* 5 mL TID	1. Weight 2. The Ashworth scale to measure spasticity 3. Strength of Body (Standard grading system), 4. Appetite, 5. Bowel habits, and 6. Stress levels (Bristol scale).
9.	Kanzode *et al.*, 2016[19]	Case study	94 days	-	1. *Deepana-Pachana* for 3 days. with *Chitrakadi Vati* (tablet) 2. *Udvartana* for 5 days with *Yava* and *Kulatha*powder for 30 min 3. *Abhyanga*for 20 min (5 days) with *Bala taila* *4. Nadi Sweda* for 20 min (5 days) *5. ChaturbhadraKalpaBasti* for 12 days. (4 *Asthapana basti* and 8 *Anuvasana basti)* *6. Asthapana basti* with *Madhutailika basti* 80 mL 7. *Anuvasana basti* with *Bala taila* 20 mL 8. Orally: *MedhyaChurna*- for 94 days. *Anupana- Madhu* (Honey) Dose- 1.5 g twice/day	*MedhyaChurna* DOSE: 1.5 g with Honey ROA: Orally TOA: Twice a day.	1. CP-QOL.
10.	Purohit *et al.*, 2017[20]	Single (6)	86 days	Open clinical trial	1. *Udvartana*: *Yava* and *Kulattha Churna* (5 days *2. Abhyanga*: *Bala Taila* 20 min (5 days) 3. *Nadi Sweda* for 20 min (for 5 days) 4. *Shashtika shali Pinda Swedna* for 8 days 5. Internal intake- *MedhyaChurna* for 86 days *Anupana – Madhu* *Kala – Abhakta* (Three courses were done with an interval of 16 days)	*MedhyaChurna* DOSE: 1.5 g with Honey ROA: Orally TOA: Twice a day before food.	1. CDC grading for motor milestones for developmental milestones. 2. The Ashworth scale for Spasticity in Muscles. 3. The MRC Scale for Muscle Power. 4. The MACS and the ADL scale were used to measure the QOL of patients with cerebral palsy. 5. General Understanding in Cognitive Processes.

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Table 2: *(Continued)*

S. No	Study ID	Sample size	Study period	Study design	Study intervention	Dosage schedule	Outcome measures
11.	Chaitanya, 2015[21]	Case study	24 days	-	1. *Vasti Karma* is preceded by local *Abhyanga* with *Maha Masha Tail* followed by *Sweda (Mrudu)* to abdomen, back and thigh regions 2. *Ksheera vasti* -Total=9 mL *Makshika* (honey): 1 mL *Sneha: Brahmi Gritham*: 2 mL *Phala gritham*: 2 mL *Ksheeram (stanyam)*: 4 mL	-	Subjective parameters like Sucking, hearing, verbal sounds, activity, recognition weight, spasticity, sleeplessness, excessive crying, irritability and unusual tenseness were considered.
12.	Dr. Avinash *et al.*, 2018[22]	Single (184)	-	Open clinical trial	1. Internal medicine: Neurovit (100 mg of Acorus calamus, *Herpestis monnieri, Cassia angustifolia, Nardostacachys jatamansi, Convolvulus pluricaulis*) in each 5 mL in dose	Neurovit (100 mg of *Acorus calamus Herpestis monnieri, Cassia angustifolia, Nardostacachys jatamansi, Convolvulus pluricaulis* in each 5 mL) Dose: 2.5–5 mL ROA: Orally TOA: 12 hourly.	1. GMFCS.
13.	Dr. Kumar and Ojha 2018[23]	Case study	34 days	-	1. *Abhyanaga: Balaashvagandhadi Taila* 20 min (15 days) 2. *Shashtika Shali Pinda Sweda* 20 min (15 days) 3. *Matra Basti-Balaashvagandhadi Taila* (15 days) *4. Samshamana Aushadha:*(30 days) *Aarvindaasava* - 10 mL, BD after food. *Brahmighrita* – 10 mL, BD after food with hot water.	*Aarvindaasava* DOSE: 10 mL ROA: Orally TOA: Twice a day *Brahmighrita* DOSE: 10 mL ROA: Orally TOA: Twice a day	1. Anthropometric assessment 2. Developmental milestones, 3. MAS, 4. Spasm scale to measure spasm intensity, 5. A system of MACS, 6. Deep tendon reflex and muscular power grading using the reflex scale.
14.	Dr. Goel and Ojha 2015[24]	Single (240)	-	-	All Spastic cerebral palsy patients who attended OPD and IPD between 2010 and 2014 received: *1. Ashtang Ghrita* *2. Abhyanga-Prasarini Taila* *3. Shashtika Shali* *4. Pinda Sweda* 3 months *Matra Basti- Devdarubaladi Taila*	*Ashtang Ghrita* DOSE: 5 mL ROA: Orally TOA: Twice in a day	The purpose of the study was to assess the prevalence of cerebral palsy trends in Rajasthan.

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Table 2: *(Continued)*

S. No	Study ID	Sample size	Study period	Study design	Study intervention	Dosage schedule	Outcome measures
15.	Meena *et al.*, 2018[25]	Case study	90 days	-	1. *Abhyanga* with *Balataila* (for 8 days) 2. *Patra-Pinda Potali sweda* (for 8 days) 3. *Shashtika Shali Pinda Swedana* (for 8 days) 4. *Matra-Basti-Mahanarayan Taila* 10 mL (for 8 days) 5. Orally: *Ashwagandha Churna* (1 g), *Kukkutandatvak Bhasma* (125 mg) and *Smriti Sagar Ras* (125 mg) BD after food, 6. *Shirobasti* with *Mahanarayantaila* (for 8 days) 7. *Pratimarshanasya* with *Jyotishmati taila* (for16 days)	*Ashwagandha Churna* (1 g), *Kukkutandatvak Bhasma* (125 mg) and *Smriti Sagar Ras* (125 mg). DOSE: 1.5 g ROA: Orally TOA: Twice a day	1. GMFCS.
16.	Mudadla and Injamuri 2016[26]	Case study	11 days	-	*Senha Vasti with Sishunamaka Sneha:* 60 mL for 11 days.	-	1. Gross motor milestones assessment. 2. The Ashworth scale for spasticity 3. MRC for muscle power.
17.	Gavali *et al.*, 2021[27]	18, Group A 18, Group B	3 months	Openclinical trial	1. Group A=Physiotherapy 2. Group B=a. *Abhyanga* with *Kshirbala taila* 15–20 min (3 months) b. *Shali Shastika Pinda Sweda* 25–30 min (21 days) and next round after 7 days (for 3 months) c. *Hapusadi Yapana Vasti* (21 days). d. *Samwardhana Ghrita* 1 mL/kg/day in 2 divided dose (3 months)	*Samwardhana Ghrita* DOSE: 5–10 mL ROA: Orally TOA: Twice a day	1. GMFCS 2. The CDC's motor milestone grading scale 3. The Modified Ashworth Scale for Spasticity 4. MRC Power scalability.
18.	Raj *et al.*, 2018[28]	16, Group A 16, Group B	90 days	Openclinical trial	Group A: *Abhyanga* with Tila Taila for 15 min then, *Parisheka* with *Dashmoola Kashaya* followed by *Salavana Upanaha* Group B: *Abhyanga with Tila Taila* for 15 min followed by lukewarm water bath and application of *Salavana Upanaha*,	-	1. Modified Ashworth scale for spasticity.
19.	Asha *et al.*, 2017[29]	12, Group A (TG) 12, Group B (CG)	2 months	Open clinical trial	Group A: Internally- *Mahamasa Taila* 2.5 mL for 2–6 years and 7 mL for 7–12 years old children. *Abhyanga- Mahasaidhava Taila* 30 min per day (1 month) Group B: External- Administration of *Mashasaindhava Taila* for (1 month)	*Mahamasha tail* DOSE: 2.5–7mL ROA: Orally TOA: Twice a day	1. Spasticity was assessed using Modified Ashworth Scale. Range of movement measurement of various joints using Goniometer.

(Contd...)

Table 2: *(Continued)*

S. No	Study ID	Sample size	Study period	Study design	Study intervention	Dosage schedule	Outcome measures
20.	Shailja *et al.*, 2014[30]	61, Group A (TG) 62, Group B (CG)	24 months	Open and controlled clinical trial	For the first 8 days, all patients received *Abhyanga* with*Moorchita Tila Taila* then, *Svedana* with *Shastika Shali Pinda Sveda*. Group A: *Mustadi-Rajayapana Basti* *Baladi Yoga* 1 g/day (for 60 days) Group B: Sterilized saline water (Placebo) *Godhumadi Vati* (Placebo) 1 g BD (for 60 days)	*Baladi Yoga* DOSE: 1 g MEDIUM: *Ghee* and Honey with ROA: Orally TOA: Twice a day *Godhumadi Vati* DOSE: 1 g with ghee and honey before food ROA: Orally TOA: Twice a day.	Subjective criteria such as 1. Routine tasks like eating, drinking, brushing teeth, taking a bath, and using the restroom. 2. Gross motor activities such as clapping hands, sitting, standing, or crawling for at least five feet. 3. 3.Fine motor skills such as putting small objects into containers, throwing balls with the thumb and index finger, holding two one-inch cubes in one hand for 30 s, and folding paper to fit into envelopes are examples. 4. Language skills, such as the capacity to comprehend spoken instructions. 5. Mental conditions such as contentment and remembering.

MACS: Manual ability classification system, ADL: Activities of daily living, GMFM: Gross motor function manual scale, CP-QOL: Cerebral palsy – quality of life, MAS: Modified Ashworth scale, GMFCS: Gross motor function classification system for cerebral palsy

ROB. The results of very few research was low and moderate. Based on data published by the authors, these evaluations are summarized in Table 4, and following discussion with co-authors, a final conclusion was presented.

Results of Individual Studies

It is briefly explained in Table 4.

Results of Syntheses

On assessing eligible studies, it was found that most commonly reported efficacy outcome was QOL scale,[13,20,21] Modified Ashworth scale,[12,14-16,19,21,24,27-30] manual ability classification system scale,[12,14-16,21,24] gross motor function measure,[13,23,26-28] Development assessment scales for Indian infants,[17] range of motion (ROM).[15,17] Improvement in subjective symptoms such as stiffness and restricted ROM is observed in almost all the studies identified. Studies that included treatment using *Udavartana*, *Abhyanga*, and *Basti* reported significant results in the improvement of Quality-of-life scale and Modified Ashworth scale.[13,16,17]

Reporting Bias

Missing data and bias in the stated result's selection are both regarded as serious for assessment and are shown in Table 3.

Certainty of Evidence

The TREND Statement–2004 Checklist was used to assess the specifics of the reported data.[10] by awarding each item two points for full reporting, one point for partial reporting, and no points for "No" reporting.[10] To reduce bias, each chosen paper was individually evaluated for quality by all reviewers before the discussion. It was determined that all of the stories were inaccurately reported based on the evaluation.

DISCUSSION

The management approaches for CP were assessed in this systematic review. The objective was to compare the available data about the safety, efficacy, and effectiveness of Ayurvedic therapies, as well as to critically review clinical data and current therapy options for CP.

A group of non-progressive neuromotor disorders with cerebral origin are referred to together as CP. The growing fetus or infant's brain is thought to be the target of this set of illnesses that affect the patient's mobility and posture. *Ayurvedic* procedure-based therapy along with internal medication submits evidence for all over effect on CP. Out of the selected studies the majority of treatment included *Udvartana* ($n = 8$), *Adhyanga* ($n = 12$), *Nadi Swedana* ($n = 6$), *Basti* (*Niruha* and *Anuvasana*) ($n = 11$), *Matra Basti* ($n = 5$),

Table 3: Assessment of ROBINS-1 for NRCTs and observational studies

S. No	Study ID	Confounding bias	Selection bias	Information bias	Reporting bias
1.	Ghuse *et al.*, 2016	Not available	Critical	Not available	Serious
2.	Sonam *et al.*, 2019	Not available	Critical	Not available	Serious
3.	Niraj and Varsha 2019	Not available	Not available	Not available	Not available
4.	Bhinde 2015	Not available	Not available	Not available	Not available
5.	Sharma and Yadav 2018	Not available	Not available	Not available	Not available
6.	Sohini and Anirudhan 2017	Not available	Not available	Not available	Not available
7.	Mamidi and Gupta 2015	Not available	Not available	Moderate	Not available
8.	Arbar *et al.*, 2019	Not available	Not available	Not available	Not available
9.	Kanzode *et al.*, 2016	Not available	Not available	Not available	Not available
10.	Purohit *et al.*, 2017	Not available	Not available	Not available	Not available
11.	Chaitanya, 2015	Not available	Not available	Not available	Not available
12.	Dr. Avinash *et al.*, 2018	Not available	Not available	Not available	Not available
13.	Dr. Kumar and Ojha 2018	Not available	Not available	Not available	Not available
14.	Dr. Goel and Ojha 2015	Not available	Not available	Not available	Not available
15.	Meena *et al.*, 2018	Not available	Not available	Not available	Not available
16.	Mudadla and Injamuri 2016	Not available	Not available	Not available	Not available
17.	Gavali *et al.*,2015	Not available	Critical	Not available	Not available
18.	Raj *et al.*, 2018	Not available	Critical	Not available	Not available
19.	Asha *et al.*,2017	Not available	Critical	Not available	Not available
20.	Shailja *et al.*, 2014	Not available	Not available	Not available	Not available

ROBINS-I: ROB in non-randomized studies of interventions

Table 4: Results of individual studies

S. No	Study ID	No. of groups	Results
1.	Ghuse, 2016	Group A Group B	Group A depicts moderate improvement (51–75%) in 16.66% of patients while 83.33% of patients had mild improvement (26–50%), Group B 66.66% patients had mild improvement (26–50%) and 33.33% of patients were improved (11–25%) in clinical condition.
2.	Sonam, 2019	Single	The study confirmed overall clinical improvement of 78.03% on gross motor function scale and about17.49% on quality-of-life scale.
3.	Niraj and Varsha 2019	Case study	The study depicted significant improvement in all milestones such as Speech (from Grade 2 to Grade 1), Verbal (from Grade 2 to Grade 1) and Able to walk with support (from Grade 3 to Grade 2). Muscle spasticity was measured on the Ashworth scale and was reduced from Grade 4 to Grade 2. MRC scale observed an improvement from Grade 1 to Grade 2 about muscle power.
4.	Bhinde, 2015	Case study	Spasm scale confirmed and 25% improvement. The manual ability classification system shows 20% improvement with the reduction in spasticity and improvement in ROM. The overall impact of the study was in the range of 10–15%.
5.	Sharma and Yadav 2018	Case study	*Panchakarma* procedures were found to be effective in promoting growth (height, weight, chest circumference), development (standing and walking without support) and also helpful in reducing spasticity of lower limb and spasm in patients.
6.	Sohini and Anirudhan 2017	Case study	The study range explained that the ROM of major joints of upper and lower limbs (ankle, hip, knee, elbow, and shoulder) were found to be improved after the second course of treatment. The ROM hip joint (adduction, abduction, internal rotation, external rotation) was improved after the second course of treatment. Based on the improvement in ROM of ankle joints, spasticity was reduced in dorsiflexion, but no improvement was noticed in plantar flexion.
7.	Mamidi and Gupta 2015	Case study	In case I, Baseline score on GMFM scale was 25.14% and after 1 month it was 30.38%, i.e., 5.24% of improvement was observed. Good improvement was found in the domains like lying and rolling (9.8%) and sitting (5%). In case II, As the child was able to walk, the only dimension assessed on GMFM scale was "Walking, Running and Jumping." The baseline score recorded on GMFM scale for walking, running, and jumping dimensions was 73.61% and after 1 month, it was 76.39%, i.e., 2.78% of improvement occurred post treatment.
8.	Arbar *et al*., 2019	Case study	In this case study, *Panchakarma* treatments and internal medication results in a 5–10% improvement in the overall effect of therapy after 10 days of treatment.
9.	Kanzode *et al*., 2016	Case study	This case study reported the overall effect of about 15–20% after the treatment period.
10.	Purohit *et al*., 2017	Single	Significant result ($P \leq 0.05$) was observed in neck holding, sitting, language, personal and social milestones of CDC grading. Highly significant result ($P \leq 0.001$)) in fine motor and insignificant result was observed in standing milestone. Length parameter has shown highly significant result (<0.001). Weight, CC, MAC Rt., MAC Lt., MTC Rt. and MTC Lt. parameters has shown significant result (<0.05). 16.66% of patients had mild improvement (26–50%), 66.66% of patients were improved (11–25%) in clinical condition and 16.66% of patients were found no improvement (0–10%).
11.	Chaitanya, 2015	Single	Subjective parameter like sucking improved gradually from spoon feed to bottle feed after 1st cycle and it gradually increased to Breastfeed on the 20th day of treatment. Weight also increased by 1 kg. Symptoms such as sleeplessness, excessive crying, irritability, and unusual tenseness were decreased.
12.	Dr. Avinash *et al*., 2018	Single	According to the study, 178 (96.7%) of the 184 children had Grade I (excellent) clinical findings, while 4 (2.1%) and 2 (1.1%) showed Grade II and Grade III improvement.
13.	Dr. Kumar and Ojha 2018	Case study	The patient's features including growth (height, weight, chest circumference), development (head holding and sitting), and spasticity reduction in the left upper and lower limb and right upper limb are all moderately improved by the combination of therapies shown in the case study.

(Contd...)

Table 4: *(Continued)*

S. No	Study ID	No. of groups	Results
14.	Goel and Ojha 2015	Single	Out of the 240 cases of Spastic C.P. that were registered for the study, 127 (52.92%) were found to be Diplegic in nature, followed by 66 (27.50%) children who were Quadriplegic in type. Others include 4 (1.67%) cases of double hemiplegia and 30 (12.50%) cases of hemiplegic pattern, monoplegia, and 5.83% occurrences of monoplegia.
15.	Meena *et al*., 2018	Case study	Before the age of two, Level V of the GMFCS - E and R was recorded, meaning that physical limitations restrict voluntary control of movement. After Panchakarma therapy, GMFCS was re-recorded and determined to be at Level III, meaning that he sometimes needs adult assistance to sit while maintaining floor sitting and takes "W sitting" (sitting between flexed and internally rotated hips and knees).
16.	Mudadla and Injamuri, 2016	Case study	1. Improvement in gross motor milestones: Child is now able to stand unassisted, walk unassisted for 5–7 min at a leisurely pace, and also climb stairs unassisted, which was not treated. The constipation has subsided, and drooling has decreased. The general state of nutrition is also improving
17.	Gavali *et al*., 2015	Group A Group B	In Group A, no statistically significant change was seen at the conclusion of the 3rd month. Results from Group B become highly significant ($P \leq 0.0001$) and show a shift of 21.05%. With a $P<0.01$, the intergroup comparison revealed that Group B had a very substantial advantage over Group A.
18.	Raj *et al*., 2018	Group A Group B	At the $P<0.05$ level, both groups had an impact on reducing spasticity. Based on objective and subjective characteristics, both groups were shown to be effective at reducing spasticity, but Group A had a better response than Group B.
19.	Asha *et al*., 2017	Group A Group B	Better improvement had occurred in the study group patients after treatment with a highest level of statistical significance with a $P<0.05$. Adductor angle after treatment. The average change after follows up in the study group was 10.4±3.5 whereas in the control group was 6.2±2.6 ($P < 0.05$.)
20.	Shailja *et al*., 2014	Group A Group B	Patients in Group A who received treatment experienced an overall improvement of 13.66%. The study group showed a significant improvement in all of these areas, including intelligence, speaking, memory, and happiness. Compared to the Group B's improvement of 2.21%.

ROM: Range of motion, GMFCS E and R: Gross motor function classification system - expanded and revised

Table 5: Management strategies of cerebral palsy

S. No	Clinical strategies	Interventions	No. of studies
1.	*Shamana* (palliative medicines)	*Medhya Churna*[12,20,21]	3
		Abhaya Ghrita[13]	1
		Samvardhana Ghrita[14,28]	2
		Ashtangaghrita[15]	1
		Baladi Yoga[31]	1
		Aarvindaasava[24]	1
2.	*Bhaya chikitsa* (external procedures)	*Udavartana* (application of dry powder to the skin).[12-18,20,21]	8
		Shastika-Shali-Pinda Swedana (hot fomentation with rice cooked in milk).[12,14,16,21,24-26,28,31]	9
		Shirodhara (dropping of stream of medicated oil in the forehead).[16]	1
		Shiropichu (placement of cotton with medicated oil in the scalp).[17]	1
		Shirobasti (pouring of medicated oil a pouch over the scalp).[26]	1
3.	*Shodhana* (purification medicines)	*Virechana* (purgation therapy).[17]	1
		Nasya (medication through nose).[16,26]	2
		Basti (therapeutic enema).[12-20,22-28,31]	16

Shasthi Shali Pinda Sweda ($n = 9$), *Nasya* ($n = 1$), *Shirodhara* ($n = 1$), *Shiropichu* ($n = 1$), and *Shirobasti* ($n = 1$).

Abhyanga is a technique that involves massaging the body with lukewarm medicinal oil. Due to its *Snigdh*(oily), *Mridu*(soft),

and *Picchila*(sticky) *Guna*, *Abhyanga* performed with oil nourishes the skin and underlying tissues. *Sparsh*(touch) is the property of *Vayu* and is in direct connection with the *Sparshnendriya*(touch receptors) which is situated in *tvacha* (skin). According to *Acharya Charak*a, *Snayu* (ligaments), *Tvacha* (skin), and *Raktavahini* (blood vessels) are the origins of *Mamsavaha Srotas* (channels in muscles). *Abhyanga* performed over *Tvacha* hence provides immediate benefits to *Mamsavaha Srotas*.[31] The medicinal oil aids in toning up and relieving spasticity. By using this method, medicinal oil may reach every layer of tissue in the body and is therefore much more effective than traditional massages. It also helps to remove toxins and other impurities from the body, enhances muscle strength by circulating body fluids, and increases body stamina and limb strength. According to Ayurveda classics regular practice of *Abhyanga* corrects the imbalance of *Doshas*, thereby enhances well-being. Medicated oil like *Bala taila* and *Mahanarayan Taila* is widely used for the *Abhyanga* as *Bala* is *Vatashamak* and *Balya* and *Mahanarayan Taila* contains contents such as *Jivaka, Rishabhaka, Kakoli,* and *Ksheera Kak*oli that are present in *Jeevaniye Mahakashya* and improves the strength of the muscles.

Udvartana is the process involving application and gentle rubbing of dry powder to the superficial aspect of body and is generally carried out with *Dravyas* like *Yava* and *Kulatha Churna*. Both these *Dravyas* have the properties of *Ruksha* (dry) *Guna*and eliminates *Kapha Dosha* that causes *Srotorodha*(obstruction to channels). *Ruksha Churna* is the best remedy to remove the clog and open the channels.

Shastika-Shali-Pinda Swedana is a subtype of *Brimhaniya Snehika Swedana* which is performed with *Shashtika Shali* rice cooked with *Dashamula* decoction and milk. *Shashtika Shali* rice has the *Snigdha*(soft), *Laghu* (light), *Brimhaniye*(nourishing) properties resulting in improvement in physical consistency, enhances flexibility and movement of joints and increases the muscular strength. *Dashamula* decoction is having *Kapha-Pitta-Vata shamak* properties and milk is comprised of *Brihmhaniye* properties which improves the undernutrition status of limbs.

Nadi Swedana is a part of *Saagni Swedana*. *Swedana* is *Srotoshuddhikara* (cleans the micro channels), *Agni deepaka* (improves digestion), *Kapha-Vata Nirodhanana* (decrease vitiated *Kapha* and *Vata Dosha*) which ultimately decreases all *Sthambhata*(stiffness) and *Guruta*(heaviness) in the body. *Swedana* drugs are having properties like *Ushana*(hot), *Tikshna*(sharp), *Sushma*(fineness) and their proper use followed by *Abhyanga*is beneficial in order to remove *Aavarana* (obstruction to range of movements) and *Srotorodha* (obstruction of nutrition channels). *Swedana* helps to increase joint mobility and ROM while reducing muscle stiffness.

Matra Basti is a subtype to *Sneha Basti*. It has been highly praised for its extensive and non-invasive use. It has been quoted as *Nirapada*i.e., it does not cause any complication and it can be administered at any time to any age of person. *Pakwashaya,* i.e., lower gastrointestinal system, which is where *Vata Dosha* is most prevalent, is where *Basti Karma* manifests. Therefore, *Basti* is effective in treating vitiated *Vata Dosha*. *Matra Basti* is a method that uses *Sneha Dravyas*, including *Ghrita* (clarified butter), *Taila* (oil), *Vasa* (fat), and *Majja* (bone marrow), each of which has unique qualities and hence has its own positive benefits.*Sneha* generally relieves obstructions in the channels caused by the *Mala*, or *Malanam Vinihanti Sangam*, and is *Vatahara*, *Mridukara* (provides softness in the channels and tissues).[32] It enhances luster and softness in the body due to its *Snigdha* (soft) *Guna*, and thanks to its *Sukshma* (fine) *Guna*, it helps the medication enter the *Srotas* (micro channels). Different *Dravyas* employed in *Basti* have *Pichhila* (sticky) Guna, protecting the mucous membrane from the unfavorable effects of irritating medications.[33]

Ayurvedic internal medicine has multisystem approach in improving QOL by improvement or correction in movement, posture, growth and development. Various *Ghritas* like *Samvardhana Ghrita*, *Brahmi Ghrita* are considered as good method of treatment in patients with affected brain growth. *Ghrita* is regarded as *Sarva Senhautmahsmritum*, or as the finest *Sneha Dravya* among all *Snigdha* substances. It is one of the daily-useable *Nitya Rasayanas* (recommended) in Ayurveda. It has a sweet flavor and gives the body tissues lusciousness and smoothness. *Ghrita* has the ability to reduce *Vata* and *Pitta* while barely boosting *Kapha*. It enhances the body's vitality and luster, as well as the digestive fire, eyesight, intelligence, and memory. *Sankarasanuvartanam*, which imitates the property of the medicine added to it and has a synergistic action when combined, is the most unusual characteristic of *ghrita*.[35]

Medhya rasayanas (*Ayurvedic* nootropic drug) act as a brain enhancer and improve intellectual power. *Medhya rasayanas* stimulate *Agni* and regulates *RasaDhatu* formation by clearing micro-channels as a neuro nutritive effect.These *Medhya* substances support mental capacity (*Dhi*), retention capacity (*Dhriti*), and recall capacity (*Smriti*). *Shita Virya* and *Madhura Vipaka*, two ingredients in *Medhya Rasayana*, promote *Kapha* and improve "*Dharana Karma*" (retention of cognition). As a result, Table 5 lists the various therapy modalities according to the disease's clinical stages. Therefore, with few side effects, Ayurvedic therapy and medications promote physical and mental health while also enhancing QOL.

The major objective of all included research was to assess the efficacy of Ayurvedic treatments for CP using various Ayurvedic ailment nomenclatures. The secondary goal varied from research to study, with the main aim being to theoretically investigate the disease and evaluate any unfavorable effects that might have been observed. It noted commonalities in the clinical results while reviewing the potential impacts of Ayurvedic therapies reported in the therapy of CP in Table 2.

Even though there is a lack of methodology uniformity, the clinical overview can still be somewhat accurately drawn because all the studies involved have improved in terms of the subjective aspects.

Nearly all of the studies cited show an improvement in subjective symptoms such drooling of saliva or decreased ROM, but the viability of maintenance cannot be determined due to the little research duration. Studies using multiple interventions, including *Udavartana*, *Shirodhara*, and *Basti*, demonstrated a significant improvement in the clinical features because the interventions target the pathogenesis of the disease and help to calm the agitated Doshas because of their predefined rejuvenating, anti-inflammatory, neuroprotective and improving brain functions (*Medhya*) property and also help to inhibit tissue degeneration, which further helps to delay the disease's further progression. All of the publications were found to be deficient in information by the TREND Statement's evaluation of the quality of the evidence because trials should be documented with greater consistency.

The ROBINS-I technique was used to assess the ROB because there were only NRCT and case studies. Most of the domains were not addressed, and a few were reported improperly. For instance, there was improper reporting of the status of interventions, co-interventions, and deviations from intended interventions, as well as a complete lack of information about confounding factors, missing data, and frequently unclear descriptions of how outcomes were measured. They were therefore classified as critical and serious ROB. The results of very few research was low and moderate.

Due to inadequate randomization, methodological inadequacy, a brief research period, inadequate sample sizes, and a significant ROBes, it was difficult to draw a meaningful scientific validity, necessitating the necessity for high-quality investigations. However, due to the disease's manifestation inyounger age of the affected participants, and most importantly, the absence of adequate therapy in traditional health sciences, it is comfortable to see this study as a primary or add-on management in CP. Additionally, the study's findings led to a significant improvement in ROM and helped in attaining of previously delayed milestones, which is extremely beneficial for addressing the subjects' QOL. Therefore, this therapeutic approach is optimistic in improving the affected participant's general condition.

CONCLUSION

The complexity of the disease's pathophysiology, the vulnerability of the age group population, the chronic nature of the disease, and the fact that *Vayu* is the most common *Dosha* affected make this condition difficult to treat. As a result, the outcome that may be quantified will be less significant, necessitating the need for higher-quality research with longer-term trials that are valid and trustworthy in terms of treatment efficacy and maintenance. Various studies selected in the review support the fact that internal medication with appropriate *Panchakarma* procedures is very useful in the management and can result in improvement in the symptoms of CP in children. Furthermore, there is growing interest in finding significant antioxidant, rejuvenating, and immune-enhancing activities with few to no adverse effects through evidence-based therapy on a worldwide scale that can be significant in improving QOL in the affected children. Ayurveda is readily available to the science that is studying medicine since it is possibly proven, tried and true, based on efficacy, and supported by evidence. Ayurvedic knowledge can point the way in the right direction by raising QOL. The present research is a comprehensive review of Ayurveda care of CP in children because a significant number of studies pertaining to the management of CP with Ayurvedic intervention have been published.

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