

Effectiveness of Ayurveda Interventions in Children with ADHD:

A Case Report

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Abstract:

Background: Attention-Deficit/Hyperactivity Disorder (ADHD) is a common neurodevelopmental behavioral disorder often found in children. The condition manifests through symptoms like inattention, hyperactivity, and impulsivity, causing challenges in daily life, including disruptions in peer relationships and academic performance. While ADHD symptoms typically emerge in preschool or early years, the median age of onset is around 7 years. According to the National Alliance on Mental Illness, ADHD impacts approximately 9% of children aged 3-17.

Although there is no direct correlation for ADHD in *ayurvedic* texts, certain abnormal behavioral traits described in the context of *Vata Prakriti*, along with features of *Unmada* such as *Anavasthitha chittatva*, *Manovibhrama*, *Smritivibhrama*, and *Acharvibhrama*, share similarities with ADHD symptoms.

Aim: The study aims to assess the impact of various conventional *Ayurveda* interventions in the management of ADHD.

Materials and Methods: The study involved the holistic treatment of a 7-year-old male child with ADHD, employing diverse *Ayurvedic* strategies. A multipronged approach was adopted, utilizing formulations like *Medhya rasayana*, *Panchakarma* procedures, and *Viddhakarma* depending upon the predominance of *doshas*.

Result: The interventions derived from *Ayurveda* demonstrated benefits in reducing ADHD symptoms in the treated child, as evidenced by improvements noted on the Conners Rating Scale.

Discussion: *Ayurveda* provides diverse *Chikitsa* modes for managing ADHD in children. Recognizing the chronic nature of ADHD, the study underscores the importance of long-term interventions that facilitate the child's better integration

into society and contribute to an improved quality of life.

Keywords: Attention-Deficit/Hyperactivity Disorder, ADHD, *Viddhakarma*, *Panchakarma*, *Ayurveda* interventions.

Introduction:

Attention-Deficit/Hyperactivity Disorder (ADHD) is a prevalent neuro-behavioral disorder observed in children, characterized by symptoms such as inattention, including difficulty in sustaining attention, poor impulse control, and hyperactivity. ^[1] ADHD poses challenges in various aspects of daily life, affecting relationships, academic performance, and overall functioning. While the onset of ADHD symptoms typically occurs in childhood, their impact can extend into adolescence and adulthood. ^[2]

ADHD is commonly observed in children aged 6 to 12, with a higher prevalence in males. ^[3] In India, the estimated prevalence of ADHD is 1.3 cases per 1000 individuals, exceeding the global average, reaching 11.32% based on a study in Coimbatore ^[4], emphasizing the need to understand and address the disorder in this specific population.

The DSM V criteria serve as the diagnostic benchmarks for ADHD, requiring the presence of more than six symptoms of a specific type in the affected child. ^[5] The exact aetiology remains uncertain, but various environmental factors ^[6], such as adopting a Western lifestyle, prenatal stress, maternal complications, and issues related to diet and daily regimen, are

considered potential contributors to these disorders.

Numerous treatment modalities exist, either in isolation or combination, with pharmacotherapy, involving psychostimulants, tricyclic antidepressants, and tranquilizers, being the primary choice. However, a significant proportion of ADHD patients using stimulants report noteworthy adverse effects, such as anorexia, weight loss, abdominal pain, sleep disturbances, irritability, depressed mood, and loss of appetite. ^[7,8] Growing concerns about side effects and uncertainties regarding the long-term safety of pharmacological treatments have prompted investigations into alternative therapeutic medicines. ^[9]

Ayurveda, an ancient traditional medical system, focuses on holistic health management. While *Ayurvedic* texts do not explicitly mention ADHD, symptomatically, ADHD can be associated with various abnormal behavioral traits described in the context of *Vata Prakriti* (*Vata* constitution). This aligns with features outlined under the concept of *Unmada* (insanity), including *Anavastitha Chittatva* (unstable state of mind due to *Vata Dosha*), *Manovibhrama* (confusion of mind), *Smritivibhrama* (agitated memory) and *Acharavibhrama* (impaired behavior). ^[10]

Ayurvedic treatment for ADHD typically involves a comprehensive approach, utilizing various types of formulations like *Medhya rasayana*, *Panchakarma* procedures, and *Viddhakarma* depending upon the predominance of *doshas*.

The current study explores the potential of diverse *Ayurvedic* interventions in managing ADHD.

Case Report:

A 7-year-old male child with K/C/O ADHD approached Kaumarbhritya OPD of our Institute with complaints of Hyperactivity, Difficulty sustaining attention, Not obeying commands, Difficulty in completing tasks, Irrelevant talking but unable to speak clearly and completely age-appropriate, interrupting conversation, aggressiveness and disturbances in sleep.

Progression of Disease:

The parents initially observed behavioural changes in their child, which they initially considered normal for his age. However, over time, his condition deteriorated, manifesting increased irritability, inattentiveness, and unresponsiveness to verbal stimuli. The child's sudden onset of hyperactivity and violent reactions raised concerns, compounded by a delay in achieving age-appropriate speech milestones. Seeking resolution, the parents consulted a physician who diagnosed the child with ADHD and prescribed medication. Dissatisfied with the outcomes, they sought further management at our hospital.

Birth History:

Prenatal history: The history denies consanguinity of parents, Hypertension, Gestational diabetes, Hyperemesis, Pre-eclampsia, bleeding, or any infection during the antenatal period. The age of the mother at the time of conception was 33 years and the father was 35 years old.

Mother had suffered from emotional disturbance and lack of nourishment during her antenatal period.

Perinatal History: Full-term born by LSCS weighed 3.3 kg but did not cry immediately after birth.

Postnatal history: H/O Neonatal Hyperbilirubinemia. NICU stay for 3 days for observation.

Developmental History: Gross motor and fine motor development were normal as per the chronological age but there was a delay with Language and Social development. The patient was unable to speak clearly and completely age-appropriate.

Immunization History: Given as per the National Immunization Schedule up to the present age.

Family History: No specific significant family history and consanguinity were found.

Personal History:

Aharaja: Appetite was poor. Vegetarian diet, dominant in *Madhura Rasa*

Viharaja: H/O of excessive use of the mobile phone by the mother to engage the child at an infantile age. Still addicted to mobile phone at present age. Disturbed sleep (3-4 hrs at night).

Examination

General Examination: Vitals were normal. The general condition of the patient was good, moderately built, afebrile, and hyperactive inattention. Physical Development: Examinations had shown no deformity.

Systemic Examination: Examination of the cardiovascular system, respiratory

system, per abdomen showed no deformity.

Table 1: Central Nervous System:

Higher mental function tested	Examination & Remarks
1. Consciousness	Alert, conscious about surroundings
2. Attention and Concentration	Difficulty sustaining attention
3. Facial Expression	Normal
4. Behavior	Hyperactivity, Not obeying commands, Interrupting a conversation, Aggressiveness, and Stubborn.
5. Identification	Body parts, numbers, and color identification are Good
6. Expression of Speech	Irrelevant talking but unable to speak clearly and completely age-appropriate
7. Memory	Good

Motor System Examination: Muscle tone: Normal, Muscle Power: Grade 5, Reflexes: Normal on both sides.

Examination showed that the child is normal but is hyperactive, inattentive, and unable to speak clearly and completely age-appropriate.

Treatment:



Table 2: Internal Treatment:

Sr No	Medicines	Dose and Frequency	Anupama	Duration
1	<i>Krimihara Yoga</i>	3gm twice a day	<i>Guda (Jaggary)</i>	15 days 10/01/23- 24/01/23
2	<i>Manasnitra Vatakam</i>	1 tab twice a day	<i>Ghrita</i>	3 months
3	<i>Brahmi Ghrita</i>	5ml twice a day	<i>Koshna Jala</i>	10/01/23- 10/04/23
4	<i>Smritisagara Rasa</i>	1 tab twice a day	<i>Ghrita</i>	3 months
5	<i>Saraswata Churna</i>	3gm twice a day	<i>Ghrita</i>	11/04/23-
6	<i>Saraswata Ghrita</i>	5ml twice a day	<i>Koshna Jala</i>	11/07/23
7	<i>Smritisagara Rasa</i>	1 tab twice a day	<i>Ghrita</i>	3 months
8	<i>Saraswatarishta (Swarnayukta)</i>	10 drops twice a day	Milk	12/07/23- 12/10/23
9	<i>Kalyanak Ghrita</i>	5ml twice a day	<i>Koshna Jala</i>	
10.	<i>Jivhapratisarana with Vacha, Yashtimadhu, Trikatu churna</i>	1gm each twice a day	<i>Madhu</i>	9 months 10/01/23- 12/10/23

Table 3: External Treatment:

Sr No	Procedure	Medicines	Duration
1	<i>Abhyanga (Sarvanga)</i>	<i>Ksheerbala Taila</i>	3 months
2	<i>Mrudu Nadi Sweda (Sarvanga)</i>	<i>Dashmoola Kwatha</i>	10/01/23- 10/04/23 f/b 7 days gap
3	<i>Basti (30ml) (on alternate day)</i>	<i>Bala Taila</i> (first 3 months) <i>Dhanwantara Taila</i> (next 6 months)	3 months 18/04/23- 18/07/23 f/b 7 days gap
4	<i>Shirodhara (on alternate day)</i>	<i>Brahmi Taila</i>	3 months 26/07/23- 26/10/23
5	<i>Nasya</i>	<i>Dhanwantara Taila</i> (first 3 months) <i>Brahmi Ghrita</i> (next 3 months)	3 months 18/04/23- 18/07/23 f/b 7 days gap 3 months 26/07/23- 26/10/23

Table 4: Viddhakarma:

Sr No	Procedure	Site	Duration
1	<i>Viddhakarma</i>	<i>Shankha, Sthapani, Apanga, Lalata, Ura</i>	Thrice a week for 9 months.

Total Duration of Treatment was 9 months.

Results:

Assessment was done based on the observed symptoms Before Treatment and After Treatment.

Conner's Parent Rating Scale-Revised (S) was used to assess the symptoms.

Table 5: Conner's Parent Rating Scale-Revised (S)

Score on Day 0	Score after 3 months of Treatment	Score after 6 months of Treatment	Score after 9 months of Treatment
68	65	52	33

Improvement in Observed Symptoms:

The patient was assessed every 3 months and the improvement was noted as follows:

1. After 3 months of treatment:

- Irritability was decreased.
- Improvement in managing anger issues.

➤ Temper control has shown improvement.

➤ Improvement in Sleep Disturbances and was able to attain peaceful sleep.

2. After 6 months of treatment:

➤ There is a mild decrease in hyperactivity.

➤ Modest improvement in attention span.

➤ Able to follow some instructions given by parents.

➤ Enhancement in reducing irrelevant talking.

3. After 9 months of treatment:

➤ There was a notable reduction in hyperactivity and the patient was able to maintain a seated position for an extended duration.

➤ Substantial increase in attention span for specific tasks or things.

➤ The patient began to comply with commands.

➤ The patient was able to complete the assigned tasks properly.

➤ The patient was able to speak meaningful sentences and spell his and family members' names correctly.

Discussion:

ADHD significantly impacts both children and their parents, leading to social challenges such as compromised peer relationships, reduced self-esteem, academic underperformance, and diminished quality of life. [11] While *Ayurvedic* classics do not explicitly mention ADHD, symptoms resembling it can be found under the category of *Unmada*, including *Anavastitha Chittatva*, *Manovibhrama*, *Smritivibhrama*, and *Acharavibhrama*. [10]

The potential causes include faulty organogenesis, brain damage, trauma, obstructed labour, metabolic changes in intra-uterine life, and environmental triggers like stress during antenatal care. The child's birth history reveals prenatal emotional disturbance, lack of nourishment, and neonatal hyperbilirubinemia.

ADHD is considered a *Tridoshajvyadhi* affecting *Mansik Doshas*, leading to vitiation at the levels of *Mana*, *Buddhi*, *Smriti*, *Cheshta*, and *Achara*. [10] Core symptoms of ADHD, such as inattention, hyperactivity, and impulsivity, are explained in *Ayurvedic* terms. Inattention (*Anavasthita chitatwam*) is linked to the derangement of *Dhee*, *Drithi*, and *Smriti*. Hyperactivity (*Cheshtavibhrama*) is described as improper activities due to increased *Chalatwa Gunam* of *Vayu* and *Raja*. Impulsivity (*Autsukya*) is associated with *Budhi Vibhrama*, causing impulsive actions or thoughts. [12]

Due to the involvement of both *Sharirikas* and *Mansik Doshas* in the etiopathogenesis, a multi-modal treatment approach is necessary for overall correction. *Ayurvedic* interventions include *Shaman* (pharmacotherapy) using drugs with *Medya* properties, *Panchakarma* procedures (purifying and detox therapy), *Rasayan* (Rejuvenation therapy), and a multimodal treatment approach such as *Viddhakarma*, all playing a vital role in managing ADHD. [13]

Rationale of Shodhana Therapy:

1. Sarwanga Abhyanga with Ksheerbala Taila followed by Dashmoola Kwatha Nadi Swedana:

Abhyanga (oleation technique), calms *Vata* in ADHD^[14], regulating dopamine and serotonin.^[15] *Sarwanga Abhyanga* followed by *Nadi Swedana* benefits ADHD by enhancing muscle circulation, nourishing, and reducing motor neuron hyperexcitability. *Ksheerbalataila's madhur rasa* and *vata-pitta-shamaka* properties promote tissue strength, benefit the sense organs, and have a pleasing effect on the mind.^[16]

2. Basti with Bala Taila and Dhanwantara Taila:

Acharya Charaka recognizes *Basti* as *Ardha Chikitsa*, the primary *Vata* treatment^[17] and crucial for regulating *Pitta*, *Kapha*, and *Sannipataja Vyadhis*.^[18] Serving as the key avenue for the gut-brain axis, *Basti* effectively calms vitiated *Vata*, promoting optimal brain function.^[19] Given ADHD's *Rajo Guna* predominance^[20], controlled *Vata* is crucial, leading to the intentional inclusion of *Basti* in the treatment plan. *Dhanwantara Taila*, a neuromuscular tonic, invigorates the nervous system and enhances sensory-motor integration, harmonizing *Vata* and *Pitta*.^[21]

3. Shirodhara with Brahmi Taila:

Shirodhara brings benefits such as improved blood circulation, stress reduction, and enhanced memory. Pressure and vibration on the forehead target the hollow sinus, intensifying therapeutic effects.^[22] This, combined with a slight temperature increase, activates the thalamus and basal forebrain, restoring serotonin and catecholamine levels for better sleep.^[22] *Bacopa monnieri*, a nootropic plant, contributes to tranquilizing^[23] and

sedative actions, enhancing cognitive function. *Brahmi Taila*, with *Vatahara*, *Sukshma*, and *Snigdhatva* properties, balances *Tarpaka Kapha*, aiding coordination disrupted by aggravated *Vata dosha*.^[24]

4. Nasya with Dhanwantara Taila and Brahmi Ghrita:

Nasya, the nasal application of drugs, directly influences the brain through the nasal mucosa, acting as a gateway to the head.^[25] It stimulates receptor cells, including olfactory nerve cells that connect the environment and the central nervous system. These olfactory nerves are linked to higher brain centres, like the hypothalamus, regulating the autonomic nervous system, hormone synthesis, emotions, behaviour, and states of consciousness.^[26] *Nasya* improves cerebral functions, alertness, and concentration, with medications often containing lipid-soluble substances for passive absorption through nasal mucosa cell walls. *Dhanwantara Taila*, a neuromuscular tonic, stimulates the nervous system and enhances sensory-motor integration with balancing properties for *Vata* and *Pitta*.^[21] *Brahmi Ghrita* is recommended for conditions like *Unmada*, *Apasmara*, and *Graha Roga*.^[27] Additionally, *Bacopa monnieri*, a nootropic plant, is known for its tranquilizing, sedative, and cognitive-enhancing properties.^[23]

5. Viddhakarma:^[28]

Viddhachikitsa, a therapeutic procedure endorsed by *Ayurvedic* compendia such as *Sushruta* and *Vagbhata*, emphasizes eliminating vitiated matter as its primary objective. According to *Ayurvedic*

principles, doshas should be expelled through the nearest route. This approach is outlined in the *Siravyadha Adhyaya* and is tailored to treat specific disease conditions.

In *Ura Pradesh* (chest region), *Viddha* therapy primarily targets *Udana*, *Vyana*, *Prana Vayu*, and *Sadhaka Pitta*. The method involves the scientific generation of local static electricity, inducing polarization on a cellular level. This process introduces micro-nutrients and facilitates the removal of metabolite waste products from cells to transportation channels.^[29] Consequently, it aids in alleviating obstructions within the *Manovaha Strotasa*.

The rationale of Shamana Therapy:

The patient underwent a treatment regimen initially consisting of *Manasmitra Vatakam* and *Brahmi Ghrita* for the initial three months. *Manasmitra Vatakam*, a compound formulation with nootropic and psychotropic properties^[30], featured ingredients like *Bacopa monnieri*, known for its sleep-promoting effects.^[31] The use of these medications resulted in an improvement in sleep disturbances, enabling the patient to achieve restful sleep.

Ghrita, a daily *Rasayana* in *Ayurveda*^[32], provided versatile benefits by aiding in the assimilation of added drug properties for a synergistic effect. Its lipophilic molecular structure facilitated the easy passage of lipids and lipid-soluble drugs through the blood-brain barrier, making it an effective vehicle for drug delivery to the central nervous system.^[33] *Brahmi Ghrita* was recommended for conditions

such as *Unmada*, *Apasmara*, and *Graha Roga*.^[27] The inclusion of *Bacopa monnieri*, with its tranquilizing, sedative, and cognitive-enhancing properties^[23], which might have contributed to the improvement in managing anger issues, irritability, and temper control.

The subsequent phase of internal treatment involved *Smritisagar Rasa*, *Saraswata Churna*, and *Saraswata Ghrita*. The ingredients in *Smritisagar Rasa* support healthy brain function, enhancing memory, intelligence, and learning skills.^[34] *Saraswata churna* is *katu*, *tikta* *Rasapradhan*, *madhur* *Vipaki* and *Laghu*, *ruksha*, and *tikshna* *Gunatmaka* which removes *avarana* of *kapha* & *tama guna* reduces *raja guna* by *kapha* and *vata shaman* leading to the elimination of *awarana* of *Manovaha Strotasa*. This contributed to a decrease in hyperactivity and an improvement in reducing irrelevant talking.^[35] *Medhya* action was observed in *Brahmi*, *shankhapushpi*, *aswagandha*, *vacha*.^[35] *Saraswata Ghrita* is effective in neuropsychiatric disturbances owing to its neuro-protective nature.^[36] The overall effect of *Medhya* drugs might have helped in modest improvement in attention span and ability to follow some instructions given by parents.

Later in the treatment, *Saraswatarishta* and *Kalyanak Ghrita* were introduced alongside *Smritisagar Rasa*. *Saraswatarishta*, a *Medhya Rasayana* formulation, exhibited actions such as *Rasayana*, antistress, adaptogenic, CNS depressant, anxiolytic, and sedative^[37], contributing to a notable reduction in hyperactivity and a substantial increase in attention span. *Kalyanak Ghrita*, with

tridoshashamak, *Medhya*, *rasayana* [38], and antioxidant properties [39], played a crucial role in treating neuropsychiatric disturbances.

The overall treatment plan also included *Jivhapratisarana* with *Vacha*, *Yashtimadhu*, and *Trikatu churna* for speech-related concerns in ADHD. *Jivhapratisarana* was implemented with *Teekshna*, *Ushna*, and *Medhya* drugs, resulting in significant improvements in the patient's speaking abilities, allowing him to form meaningful sentences and correctly spell his and family members' names.

Conclusion:

The study aligns ADHD symptoms with *Ayurvedic* concepts such as *Vata Prakriti* and features of *Unmada*, emphasizing the role of *doshas* in the etiopathogenesis of ADHD and multi-pronged *Ayurvedic* approach, combining *Medhya Rasayana*, various herbal formulations, *Panchakarma* procedures (*Abhyanga*, *Nadi Sweda*, *Basti*, *Shirodhara*), *Vidhakarman* targeting the predominance of *doshas*.

The results indicate a progressive improvement in ADHD symptoms over 9 months of *Ayurvedic* treatment. The Conners Parent Rating Scale scores show a significant improvement at different stages of treatment, including decreased irritability, improved anger management, better temper control, reduced hyperactivity, enhanced attention span, and improved ability to follow instructions and complete tasks.

The study highlights the importance of individualized, long-term treatment

strategies in the management of ADHD. However, it's essential to note that the findings are based on a single case, and further research with larger sample sizes and controlled studies is necessary to establish the generalizability and efficacy of *Ayurvedic* interventions for ADHD.

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