RESEARCH PAPER

Effect of Panchagavya Ghrita Matrabasti on Cognitive Functions in Children with ADHD A Randomised Clinical Study

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ABSTRACT
Attention Deficit Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder affecting children, characterized by inattention, hyperactivity, and impulsivity. Current pharmacological interventions have significant adverse effects, necessitating exploration of safer Ayurvedic alternatives.To evaluate the efficacy of Panchagavya Ghrita Matra Basti along with Shiroabhyanga in managing ADHD symptoms and compare it with oral administration of Panchagavya Ghrita. A randomized comparative clinical trial was conducted on 100 children aged 6-12 years diagnosed with ADHD using DSM-V criteria. Participants were randomly allocated into two groups: Group A (n=50) received Panchagavya Ghrita Matra Basti (transrectal) with Brahmi Taila Shiroabhyanga for 60 days; Group B (n=50) received oral Panchagavya Ghrita with Brahmi Taila Shiroabhyanga for 60 days. Assessments were conducted at baseline, 30th, 60th, and 90th day using Vanderbilt ADHD Diagnostic Parent Rating Scale and PedsQL. Statistical analysis employed Friedman test for within-group and Mann-Whitney U test for between-group comparisons. Both groups showed significant improvement in ADHD symptoms ($p<0.001$). Group A demonstrated superior reduction in Predominantly Hyperactive/Impulsive subtype scores at 90th day (Mean difference: 3.62, $p<0.001$) compared to Group B (Mean difference: 3.84, $p<0.001$). Total Positive Symptom Score in Inattentive subtype showed significant between-group difference favoring Group A at 90th day ($p<0.001$). Physical, emotional, social, and school functioning improved significantly in both groups ($p<0.001$), with Group A showing better school functioning at 90th day ($p=0.041$).Panchagavya Ghrita Matra Basti with Shiroabhyanga is an effective and safe therapeutic option for managing ADHD in children, with superior outcomes in hyperactive/impulsive symptoms compared to oral administration.

Keywords: ADHD, Panchagavya Ghrita, Matra Basti, Shiroabhyanga, Cognitive functions, Ayurveda
How to cite this article: Pathak PCN, Dash DP, Singh S., Effect of Panchagavya Ghrita Matrabasti on Cognitive Functions in Children with ADHD A Randomised Clinical Study. Int J Drug Deliv Technol. 2026;16(3s): 330-337; DOI: 10.25258/ijddt.16. 330-337
Source of support: Nil.
Conflict of interest: None

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) represents one of the most prevalent neurodevelopmental disorders affecting children worldwide, with significant implications for academic performance, social integration, and long-term quality of life. Characterized by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with developmental functioning, ADHD poses substantial challenges to affected children, their families, and educational systems (Kiragasur et al., 2020). The disorder's etiology involves complex interactions between genetic predisposition, neurobiological factors, and environmental influences, making its management particularly challenging in contemporary pediatric practice.The global prevalence of ADHD in children and adolescents is estimated to be approximately 8.0%, with higher rates observed in males compared to females (Ayano et al., 2023). In the Indian context, prevalence rates vary considerably across different regions and populations, ranging from 2% to 17% (Joshi & Angolkar, 2021). This wide variation reflects differences in diagnostic criteria, assessment methodologies, and cultural factors influencing symptom recognition and reporting. The COVID-19 pandemic has further exacerbated challenges for children with neurodevelopmental conditions, including ADHD, due to disruptions in routine, reduced access to therapeutic services, and increased screen time (Döpfnor & Banaschewski, 2021). The clinical presentation of ADHD encompasses three core symptom domains: inattention (difficulty sustaining attention, distractibility, organizational difficulties), hyperactivity (excessive motor activity, restlessness, difficulty engaging in quiet activities), and impulsivity (difficulty waiting turns, interrupting others, acting without consideration of consequences).

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These symptoms must be present in multiple settings (home, school, social situations) and cause significant functional impairment to meet diagnostic criteria according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) (Rigler et al., 2016). The neurobiological underpinnings of ADHD involve dysregulation of prefrontal-striatal-cerebellar circuits and imbalances in neurotransmitter systems, particularly dopamine and norepinephrine. Genetic studies have implicated candidate genes including the dopamine transporter gene (DAT1) and dopamine D4 receptor gene (DRD4) in the pathogenesis of ADHD (Kliegman et al., 2020). Additionally, environmental risk factors such as prenatal substance exposure, low birth weight, prematurity, and psychosocial stressors contribute to disorder manifestation and severity. Comorbid psychiatric conditions frequently accompany ADHD, including oppositional defiant disorder (ODD), conduct disorder, anxiety disorders, and specific learning disabilities. These comorbidities complicate diagnosis, treatment planning, and prognosis, often requiring multidisciplinary therapeutic approaches. The presence of ADHD also increases risks for academic underachievement, peer relationship difficulties, accidental injuries, and later substance use disorders if left untreated or inadequately managed (Connor et al., 2003). Conventional pharmacological management of ADHD primarily involves psychostimulant medications such as methylphenidate and amphetamine derivatives, which work by increasing dopamine and norepinephrine availability in synaptic clefts. While these medications demonstrate efficacy in symptom reduction for many children, they are associated with significant adverse effects including decreased appetite, sleep disturbances, irritability, tics, and potential cardiovascular risks (Bowling & Nettleton, 2020). Furthermore, concerns regarding growth suppression with prolonged use, potential for misuse, and variable individual responses necessitate exploration of alternative therapeutic approaches. Non-pharmacological interventions including behavioral therapy, parent training, educational support, and cognitive-behavioral therapy form essential components of comprehensive ADHD management. However, access to these services remains limited in many regions, and their effectiveness varies considerably across individuals. The combination of pharmacological and behavioral interventions typically yields optimal outcomes, yet the search for safer, more accessible treatment options continues. Ayurveda, the traditional Indian system of medicine, offers a holistic approach to neurodevelopmental disorders through the concept of Manovaha Srotas (channels carrying mental functions) and conditions resembling ADHD described as Unmada. According to classical Ayurvedic texts, disorders of the mind arise from imbalances in the three doshas (Vata, Pitta, Kapha) and involve the heart, mind, and channels of consciousness. The symptoms of ADHD correlate with Vata vitiation particularly, manifesting as instability, excessive movement, and difficulty concentrating. Panchagavya Ghrita, a classical Ayurvedic formulation, combines five cow-derived products: cow dung, curd, milk, urine, and ghee. Each ingredient possesses unique therapeutic properties according to Ayurvedic pharmacology (Rasa, Guna, Virya, Vipaka). Cow ghee (Ghrita) is specifically indicated for Unmada and Apasmara (epilepsy/mental disorders) in Charaka Samhita, described as Medhya (intellect-promoting) and Rasayana (rejuvenating). The combination of these five products creates a synergistic formulation targeting multiple pathways involved in cognitive dysfunction. Matra Basti, a therapeutic enema using small quantities of medicated oil or ghee, represents a unique Ayurvedic procedure for conditions affecting the nervous system. Through its action on Apana Vata (the sub-dosha governing downward movement) and its systemic absorption, Matra Basti can influence central nervous system function. The transrectal route offers advantages of bypassing first-pass metabolism and potentially delivering therapeutic compounds directly to systemic circulation, making it particularly suitable for neurological conditions. Shiroabhyanga, or therapeutic head massage with medicated oil (Brahmi Taila), complements the internal treatment by addressing Vata disorders localized in the head and neck region. Brahmi (Bacopa monnieri), the primary ingredient in Brahmi Taila, has well-documented cognitive-enhancing properties supported by modern research, including improvement in memory, attention, and information processing speed.Previous research on Ayurvedic interventions for ADHD has shown promising results. Bhalerao et al. (2013) evaluated Brahmi Ghrita in children with ADHD, demonstrating a 66% decrease in total ADHD scores in a pilot exploratory study, although a subsequent confirmatory study showed only 16% improvement comparable to methylphenidate. Gupta and Mamidi (2013) conducted a comparative study of Naladadi Ghrita and Kushmanda Ghrita in ADHD, finding both formulations effective with no significant difference between them. Singhal et al. (2010) investigated an Ayurvedic compound containing Brahmi, Ashwagandha, and Tagar with and without Shirodhara, concluding that the combination with Shirodhara was more effective in reducing reaction time and improving attention span. Despite these encouraging findings, no previous research has specifically evaluated Panchagavya Ghrita administered through Matra Basti in ADHD management. The present study addresses this gap by systematically comparing two routes of administration of Panchagavya Ghrita (transrectal Matra Basti versus oral) while maintaining Shiroabhyanga as a common adjunctive therapy. This randomized comparative clinical trial aims to generate evidence regarding optimal therapeutic approaches for ADHD within the Ayurvedic framework, potentially offering safer and more effective treatment options for affected children. The rationale for investigating Matra Basti administration stems from classical Ayurvedic principles suggesting enhanced efficacy for disorders of the nervous system when medications are administered through routes targeting Apana Vata. Modern pharmacological understanding of enhanced bioavailability through rectal administration further supports this approach. By comparing two administration routes, this study seeks to determine whether the additional procedural intervention of Matra Basti confers therapeutic advantages over simple oral

administration, thereby guiding clinical decision-making in Ayurvedic practice.

2. OBJECTIVES

To evaluate the efficacy of Shiroabhyanga with Brahmi Taila and Panchagavya Ghrita Matra Basti in the management of Attention Deficit Hyperactivity Disorder in children aged 6-12 years.

To evaluate the efficacy of Shiroabhyanga with Brahmi Taila and oral administration of Panchagavya Ghrita in the management of Attention Deficit Hyperactivity Disorder in children aged 6-12 years.

To compare the relative efficacy of Panchagavya Ghrita Matra Basti versus oral Panchagavya Ghrita (both with Shiroabhyanga) in improving cognitive functions and reducing ADHD symptoms in children.

3. LITERATURE REVIEW

The global burden of ADHD in children and adolescents is substantial, with meta-analyses confirming approximately 8.0% prevalence worldwide (Ayano et al., 2023). Indian epidemiological studies reveal prevalence rates between 2-17%, reflecting regional variations in diagnostic practices and population characteristics (Joshi & Angolkar, 2021). The disorder's impact extends beyond childhood, with approximately 60% of affected individuals continuing to experience significant symptoms into adolescence and adulthood, affecting educational attainment, employment stability, and interpersonal relationships (Kliegman et al., 2020).Dopaminergic and noradrenergic dysfunction remains central to ADHD neurobiology, with neuroimaging studies demonstrating structural and functional abnormalities in prefrontal cortex, basal ganglia, and cerebellum (Connor et al., 2003). Genetic association studies have consistently implicated dopamine transporter (DAT1) and dopamine D4 receptor (DRD4) genes, though the genetic architecture involves multiple genes with small effect sizes rather than single-gene causation. Environmental factors including maternal smoking during pregnancy, low birth weight, and psychosocial adversity interact with genetic predisposition to modulate disorder expression.While psychostimulants demonstrate short-term efficacy in 70-80% of children with ADHD, concerns regarding cardiovascular safety, growth suppression, and potential for diversion limit their acceptability (Bowling & Nettleton, 2020). Adverse effects including appetite suppression (occurring in 30-40% of users), sleep difficulties (25-30%), and mood changes necessitate careful monitoring and often lead to treatment discontinuation. Non-stimulant options such as atomoxetine offer alternative mechanisms but show slower onset and different side effect profiles without eliminating concerns entirely.In Ayurveda, ADHD symptoms correlate with Vata vitiation and disorders of Manovaha Srotas. Unmada, described in Charaka Samhita, encompasses conditions affecting mental function with features including disturbed perception, inappropriate behavior, and cognitive impairment (Sharma, 2005). Ghrita (medicated ghee) preparations are specifically recommended for Unmada and Apasmara, with Panchagavya Ghrita combining five cow products for synergistic therapeutic effects. The concept of Medhya Rasayana encompasses drugs that promote intellect, memory, and cognitive function. Each component of Panchagavya Ghrita contributes unique properties: cow dung (Tikta, Kashaya Rasa; Ushna Virya) provides Vata-shamaka effects; curd (Madhur, Amla Rasa; Ushna Virya) balances Vata while potentially increasing Kapha and Pitta; milk (Madhur Rasa; Shita Virya) pacifies Vata and Pitta; urine (Katu, Tikta Rasa; Ushna Virya) addresses Kapha and Vata; and ghee (Madhur Rasa; Shita Virya) acts as Tridoshaghna (balances all three doshas) while specifically indicated for Unmada, Apasmara, and Moorchha (Shastri, 2002; Shukla & Tripathi, 2006).Bhalerao et al. (2013) conducted a two-phase study of Brahmi Ghrita in ADHD, reporting 66% improvement in pilot phase but only 16% in confirmatory phase, similar to methylphenidate comparator. Gupta and Mamidi (2013) compared Naladadi Ghrita with Kushmanda Ghrita, finding both effective individually without significant inter-group differences. Singhal et al. (2010) investigated an Ayurvedic compound (Brahmi, Ashwagandha, Tagar) with and without Shirodhara, demonstrating superior reaction time improvement in the Shirodhara combination group.Matra Basti, utilizing small oil volumes (30-40ml), offers advantages of shorter duration, greater patient acceptability, and targeted Vata pacification (Sharma, 2005).

Research Gaps

Despite promising preliminary evidence for Ayurvedic interventions in ADHD, no previous studies have specifically evaluated Panchagavya Ghrita administered through Matra Basti. The comparative effectiveness of different administration routes remains unexplored, limiting evidence-based treatment selection in clinical practice. This study addresses these gaps through rigorous randomized design, comprehensive assessment, and appropriate statistical analysis.

RESEARCH METHODOLOGY

A randomized comparative clinical trial was conducted by Sri Sri College of Ayurvedic Science and Research Hospital, Sri Sri University, Cuttack, Odisha, at SRV Ayurvedic Medical College and Hospital, Lucknow, Uttar Pradesh, India, over a period of 2 years and 6 months. The study protocol was approved by the Institutional Ethics Committee (IEC/SSU/043-2024), and written informed consent was obtained from parents/guardians of all participants, with assent obtained from children where appropriate. **CTRI/2025/01/078848**

Sample Size

A total of 100 children aged 6-12 years diagnosed with ADHD according to DSM-V criteria were enrolled and randomly allocated into two equal groups (n=50 each) using computer-generated random numbers. Group A received Panchagavya Ghrita Matra Basti (transrectal) along with Brahmi Taila Shiroabhyanga, while Group B received oral Panchagavya Ghrita along with Brahmi Taila Shiroabhyanga for 60 days.

Inclusion criteria: Children aged 6-12 years of either sex, meeting DSM-V criteria for ADHD, whose parents provided written informed consent. Exclusion criteria:

Children with acute or chronic infections, cerebral palsy, mental retardation, epilepsy, hearing defects, or those who received modern pharmacological intervention for ADHD within the preceding year.Shiroabhyanga (common to both groups): Brahmi Taila was applied to the scalp with gentle massage once daily for 60 days.

Group A (Matra Basti): Panchagavya Ghrita was administered as Matra Basti in doses of 30ml for children aged 6-8 years and 40ml for children aged 8-12 years, once daily after food in the morning for 60 days.

Group B (Oral): Panchagavya Ghrita was administered orally in doses of 5ml for children aged 6-8 years and 7.5ml for children aged 8-12 years, twice daily before food on empty stomach with warm water as Anupana for 60 days.

Assessment Tools and Schedule

Assessments were conducted at baseline (day 0), 30th day, 60th day, and 90th day (follow-up) using:

1. Vanderbilt ADHD Diagnostic Parent Rating Scale: 55 items covering inattention (9 items), hyperactivity/impulsivity (9 items), oppositional-defiant disorder (8 items), conduct disorder (14 items), anxiety/depression (7 items), and performance (8 items). Frequency codes: 0=Never, 1=Occasionally, 2=Often, 3=Very Often.

2. PedsQL (Pediatric Quality of Life Inventory): Assessed physical, emotional, social, and school functioning domains.

6. Data Analysis

The study enrolled 100 children with ADHD, equally distributed between Group A (Matra Basti) and Group B (Oral). The demographic profile revealed comparable baseline characteristics between groups, ensuring valid inter-group comparisons.

Table 1: Baseline Demographic Characteristics of Study Participants

Parameter	Group A (n=50)	Group B (n=50)	Total (N=100)	p-value
Age (years) Mean ± SD	9.26 ± 2.08	9.28 ± 2.03	9.27 ± 2.04	0.914
Sex				0.056
Male	38 (76.0%)	29 (58.0%)	67 (67.0%)	
Female	12 (24.0%)	21 (42.0%)	33 (33.0%)	
Religion				0.027
Hindu	35 (70.0%)	44 (88.0%)	79 (79.0%)	
Muslim	15 (30.0%)	6 (12.0%)	21 (21.0%)	
Habitat				0.822
Urban	36 (72.0%)	37 (74.0%)	73 (73.0%)	
Rural	14 (28.0%)	13 (26.0%)	27 (27.0%)	

Statistically significant ($p < 0.05$)

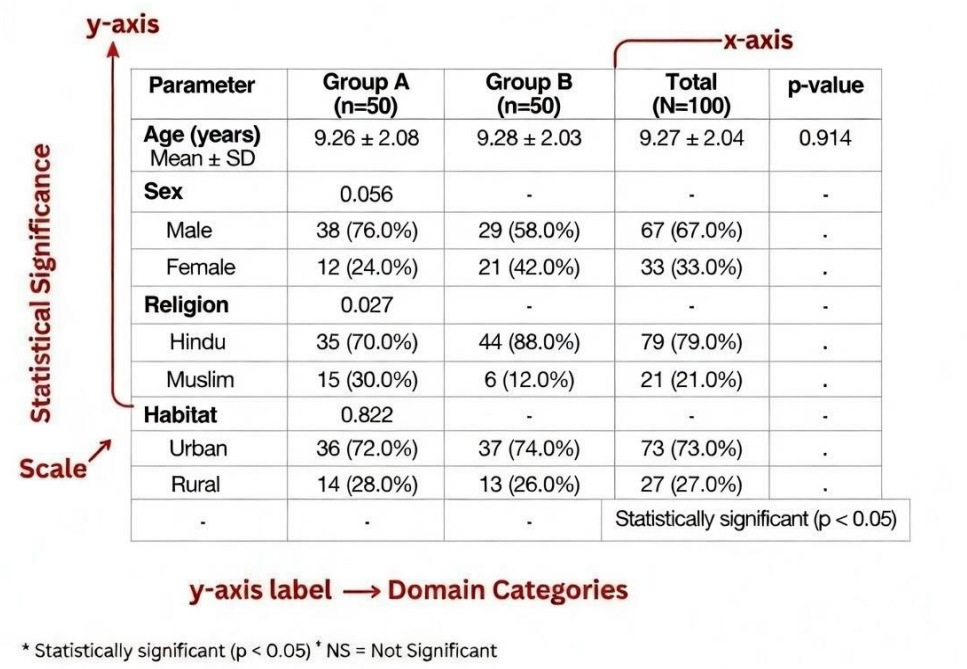

Figure-1- Baseline demographic Chararcter

The groups were well-matched for age (p=0.914) and habitat (p=0.822). While sex distribution showed a trend toward more males in Group A(76% vs. 58%), this difference did not reach statistical significance (p=0.056). Religion distribution differed significantly (p=0.027), with more Hindu participants in Group B. Both groups demonstrated significant improvements across all ADHD subtypes over the 90-day study period, as assessed by the Vanderbilt ADHD Diagnostic Parent Rating Scale.

Table 2: Group Comparisons – ADHD Symptom Reduction

Parameter	Group	Baseline (Mean ± SD)	30th Day (Mean ± SD)	60th Day (Mean ± SD)	90th Day (Mean ± SD)	Friedman χ^2	p-value
Predominantly Inattentive Subtype	A	7.44 ± 1.72	7.32 ± 1.88	5.66 ± 1.86	2.30 ± 1.64	115.61	<0.001
	B	7.36 ± 1.88	7.22 ± 2.24	5.64 ± 2.02	2.36 ± 1.52	138.09	<0.001
Predominantly Hyperactive/Impulsive Subtype	A	5.20 ± 2.10	5.04 ± 2.10	3.04 ± 1.68	1.58 ± 1.16	137.41	<0.001
	B	4.96 ± 1.97	4.90 ± 1.84	3.00 ± 1.54	1.12 ± 0.96	134.78	<0.001
ADHD Combined	A	3.56 ± 6.44	3.46 ± 6.26	2.10 ± 3.97	0.76 ± 1.65	35.27	<0.001
	B	3.04 ± 6.16	2.98 ± 6.04	1.70 ± 3.81	0.52 ± 1.31	29.17	<0.001

Statistically significant (p < 0.001)

Post-hoc analysis with Bonferroni correction revealed that significant improvements in both groups occurred primarily between baseline and 60th day, and baseline and 90th day, with minimal changes observed at 30th day. For the Predominantly Inattentive subtype, Group A showed mean reduction from 7.44 to 2.30 (69.1% improvement) while Group B reduced from 7.36 to 2.36 (67.9% improvement) at 90th day. The Hyperactive/Impulsive subtype demonstrated 69.6% improvement in Group A (5.20 to 1.58) and 77.4% improvement in Group B (4.96 to 1.12).

Table 3: Between-Group Comparison of Outcomes at 90th Day

Parameter	Group A (n=50) Mean ± SD	Group B (n=50) Mean ± SD	Mann–Whitney U	p-value
Predominantly Inattentive Subtype	2.30 ± 1.64	2.36 ± 1.52	1193.5	0.692
Predominantly Hyperactive/Impulsive Subtype	1.58 ± 1.16	1.12 ± 0.96	959.5	0.037
ADHD Combined	0.76 ± 1.65	0.52 ± 1.31	1170.5	0.441
Oppositional-Defiant Disorder Screen	0.38 ± 0.53	0.44 ± 0.50	1161.0	0.471
Anxiety/Depression Screen	0.58 ± 0.81	0.72 ± 0.86	1141.5	0.390
Impairment in Performance	0.94 ± 0.84	0.94 ± 0.84	1250.0	1.000

Statistically significant (p < 0.05)

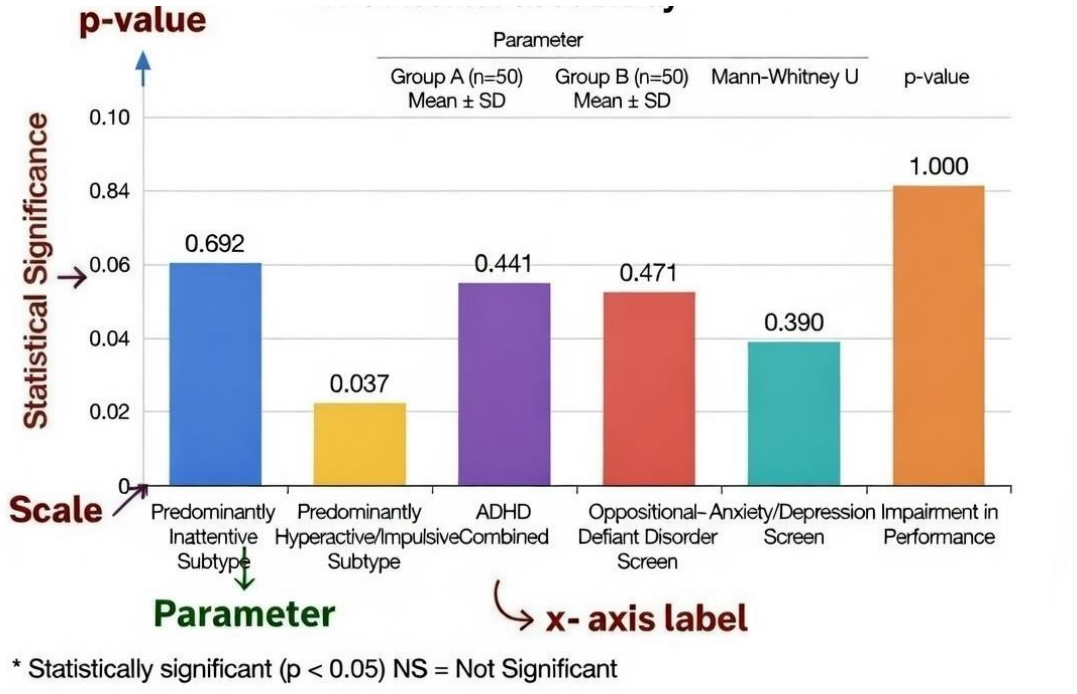

Figure-2- Group comparison

Table 4: Total Positive Symptom Score in Predominantly Inattentive Subtype

Time Point	Group A (n=50) Mean ± SD	Group B (n=50) Mean ± SD	Mann–Whitney U	p-value
Baseline	6.80 ± 1.94	7.88 ± 1.47	765.0	<0.001
30th Day	6.64 ± 2.30	7.78 ± 1.61	795.5	<0.001
60th Day	4.54 ± 1.80	6.63 ± 1.62	396.0	<0.001
90th Day	1.57 ± 1.32	3.00 ± 1.54	586.0	<0.001

Statistically significant (p < 0.001)

Comorbidity Screening Results

Oppositional-Defiant Disorder screen scores improved significantly in both groups over 90 days (Group A: 1.10 to 0.38, 65.5% improvement; Group B: 1.18 to 0.44, 62.7% improvement), with both showing statistically significant within-group changes ($p<0.001$). Anxiety/Depression screen scores also improved significantly (Group A: 1.24 to 0.58, 53.2% improvement; Group B: 1.34 to 0.72, 46.3% improvement). Conduct Disorder screen scores remained at zero throughout the study in both groups, indicating absence of this comorbidity in the study population.

Table 5: Quality of Life Domain Scores at 90th Day – Age Group 8–12 Years

Domain	Group A (n=37) Mean ± SD	Group B (n=36) Mean ± SD	Mann–Whitney U	p-value
Physical Functioning	94.93 ± 2.25	94.27 ± 2.53	786.5	0.150
Emotional Functioning	84.86 ± 6.51	85.69 ± 5.09	614.0	0.555
Social Functioning	82.84 ± 10.18	82.50 ± 8.41	747.0	0.367
School Functioning	90.95 ± 4.38	92.92 ± 4.98	490.0	0.041

Statistically significant (p < 0.05)

Table 6: Quality of Life Domain Scores at 90th Day – Age Group 6–7 Years

Domain	Group A (n=12–13) Mean ± SD	Group B (n=14) Mean ± SD	Independent t-test	p-value
Physical Functioning	93.75 ± 2.21	92.63 ± 3.60	0.962	0.345
Emotional Functioning	87.92 ± 6.90	84.29 ± 6.75	1.354	0.188
Social Functioning	80.42 ± 11.96	81.43 ± 8.64	0.250	0.805
School Functioning	89.62 ± 5.19	86.79 ± 6.39	1.257	0.220

Quality of life improvements were observed across all domains in both groups and age subgroups. In the 8-12 years age group, Group B demonstrated significantly better School Functioning at 90th day (p=0.041). No other significant between-group differences were observed in quality of life outcomes, indicating comparable improvements across physical, emotional, and social domains regardless of treatment group.

6.7 Age Subgroup Analysis

Separate analysis of children aged 6-7 years (n=27) and 8-12 years (n=73) revealed consistent patterns of improvement across both age groups. In the younger age group, both interventions produced significant within-group improvements across all domains, with no statistically significant between-group differences at any time point. This suggests that both Matra Basti and oral administration are effective in younger children, with comparable efficacy.

6.8 Safety and Tolerability

No adverse events were reported during the 90-day study period in either group. Vital parameters (heart rate, respiratory rate, temperature) remained within normal ranges throughout the study, with no clinically significant changes observed. Liver and kidney function tests performed before and after the trial showed no abnormalities, confirming the safety of both interventions.

7. RESULTS AND DISCUSSION

The present study demonstrates that Panchagavya Ghrita, administered either as Matra Basti or orally along with Shiroabhyanga, produces significant and clinically meaningful improvements in ADHD symptoms and overall quality of life in children aged 6–12 years. Both null hypotheses (H_{01} and H_{02}) were rejected, confirming the therapeutic efficacy of both intervention approaches. A substantial reduction (67.9–77.4%) in core ADHD symptoms was observed, which compares favorably with previously reported Ayurvedic interventions and is comparable to, or slightly better than, conventional stimulant response rates. Importantly, these benefits were achieved without adverse effects. Although a statistically significant difference was noted in the Predominantly Hyperactive/Impulsive subtype favoring oral administration (p=0.037), the clinical difference was modest. Overall outcomes across subtypes and quality-of-life domains indicate comparable efficacy between routes. However, consistently lower Total Positive Symptom Scores in the Inattentive subtype for the Matra Basti group suggest a possible advantage of transrectal administration for attention-related symptoms. From an Ayurvedic perspective, Panchagavya Ghrita pacifies aggravated Vata dosha and enhances Medhya (cognitive) and Rasayana (rejuvenative) functions, thereby supporting attention, behavior regulation, and neurodevelopment. Modern interpretations suggest neuroprotective, antioxidant, anti-inflammatory, and neurotransmitter-modulating effects that may influence ADHD-related pathways. Matra Basti may enhance bioavailability by partially bypassing hepatic first-pass metabolism, potentially explaining its relative benefit in inattentive symptoms. Significant improvements in comorbid oppositional and anxiety symptoms further strengthen its clinical relevance, as these conditions commonly complicate ADHD management. Quality-of-life gains across physical, emotional, social, and academic domains confirm meaningful functional improvement. The excellent safety profile, absence of adverse events, and comparable efficacy across age groups highlight Panchagavya Ghrita as a promising, safe, and integrative therapeutic option. Future multicenter, long-term studies with objective neurocognitive measures are warranted to validate and expand these findings.

8. CONCLUSION

This randomized comparative clinical trial demonstrates that Panchagavya Ghrita, administered either as Matra Basti or orally along with Shiroabhyanga, is effective and safe for managing ADHD in children aged 6-12 years. Both interventions produced clinically significant reductions in core ADHD symptoms (68-77% improvement) and substantial improvements in quality of life across physical, emotional, social, and school functioning domains. While oral administration showed statistically superior outcomes for hyperactive/impulsive symptoms, Matra Basti demonstrated consistently better Total Positive Symptom Scores in the Inattentive subtype throughout the study period. The excellent safety profile and absence of adverse effects contrast favorably with conventional pharmacotherapy, supporting Panchagavya Ghrita as a viable therapeutic option. Age subgroup analyses confirmed efficacy in both younger (6-7 years) and older (8-12 years) children, with comparable outcomes between administration routes in the younger age group. These findings support the integration of Ayurvedic interventions into comprehensive ADHD management protocols and provide evidence-based guidance for treatment selection. Future research should explore long-term outcomes, optimal dosing strategies, and neurobiological mechanisms underlying the therapeutic effects of Panchagavya Ghrita in ADHD.

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