



Literature Review On Role Of Shirodhara In Management Of Attention Deficit Hyperactivity Disorder In Childrens

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Abstract: Attention-Deficit Hyperactivity Disorder (ADHD) is recognized as the most prevalent neurobehavioral condition in childhood. It is a multifactorial disorder of brain function marked by the triad of inattention, hyperactivity, and impulsivity. Genetic predisposition plays a major role in its causation, often influenced by environmental triggers. Although it can occur across all age groups, school-aged children are most frequently affected. In contemporary medicine, management strategies primarily include stimulant medications along with psychotherapeutic interventions. Ayurveda explains that any illness arises from the imbalance of either sharirika (physical) or manasika (psychological) doshas, or both. The characteristic symptoms of ADHD indicate involvement of vata dosha on the physical level and raja dosha on the mental plane. Shirodhara, an Ayurvedic therapeutic procedure described for mental health disorders, holds potential as a supportive intervention in behavioral conditions like ADHD. Considering its calming and stabilizing effect on the mind, Shirodhara may serve as an effective complementary approach in the management of neurobehavioral disorders.

Index Terms - ADHD, Inattention, Hyperactivity, Impulsivity, Shirodhara.

I. INTRODUCTION

Attention and information processing in the brain rely on proper arousal, alertness, and intact neurocognitive functions. These processes are regulated by anatomic and neurochemical systems involving the brainstem, basal ganglia, limbic structures such as the amygdala and hippocampus, as well as the frontal lobes. Dopamine and its neural pathways are regarded as the key neurotransmitter systems modulating attention. Cognitive mechanisms—responsible for learning, organization, executive functions, and information processing—form the basis of academic and behavioral development. Children with deficits in these mechanisms often present with variable degrees of attentional dysfunction¹.

II. RESEARCH METHODOLOGY

This article is a narrative literature review conducted to explore the role of Shirodhara in the management of Attention Deficit Hyperactivity Disorder (ADHD). Relevant literature was searched using electronic databases including PubMed, Scopus, Google Scholar, AYUSH Research Portal, and reference lists of key articles.

The selected studies were analyzed for objectives, study design, interventions, outcomes, and relevance to ADHD symptom management. The information was then synthesized to provide a comprehensive overview of current evidence regarding the role of Shirodhara as an adjunct or alternative therapy for ADHD.

Attention-Deficit Hyperactivity Disorder (ADHD) is a prevalent and chronic neurodevelopmental disorder that typically begins in childhood. It is characterized by persistent patterns of inattention, excessive activity, and impulsive behavior. Studies indicate that approximately 5–10% of school-aged children are affected worldwide, although rates vary by region. Among adolescents, the prevalence is estimated at 2–6%, while about 2% of adults continue to exhibit symptoms into later life. Despite its frequency, ADHD remains underrecognized and underdiagnosed in many pediatric and adolescent populations. The disorder is also commonly associated with other behavioral or emotional conditions, such as oppositional defiant disorder, conduct disorder, learning difficulties, and anxiety disorders².

The causation of ADHD is multifactorial, involving genetic, environmental, and psychosocial influences. Genetic studies indicate the role of dopamine transporter (DAT1) and dopamine receptor (DRD4) gene variations in susceptibility. Environmental contributors such as maternal smoking, alcohol intake during pregnancy, exposure to lead, and perinatal complications (e.g., toxemia, prolonged labor, or complicated delivery) increase the risk. Structural and functional brain abnormalities have also been documented in affected children, with some studies linking traumatic brain injury to later development of ADHD symptoms. Family-related stresses, inconsistent parenting, and poor peer interactions further intensify behavioral manifestations³.

Given its impact on learning, social interactions, and emotional well-being, early identification and comprehensive management of ADHD are essential. Treatment goals should extend beyond symptom control to enhancing study habits, social skills, self-esteem, and overall family functioning. Behavioral therapy, usually delivered over 8–12 sessions, targets disruptive behaviors and skill deficits, while parents are guided on effective strategies to support the child both at home and in academic settings.

Shirodhara is described in Ayurveda as a therapeutic technique categorized under bahya snehana (external oleation). Classical texts highlight this method in different ways: Acharya Charaka referred to it as murdhni taila, while Acharya Vagbhata described a similar procedure under the name murdha taila. The term “Shirodhara” is derived from two Sanskrit words—shiro (head) and dhara (stream)—indicating the gentle and continuous pouring of medicated liquids such as ghrita (clarified butter), takra (buttermilk), ikshurasa (sugarcane juice), kashaya (herbal decoction), or ksheera (milk) over the forehead in a steady, rhythmic manner. In Ayurveda, the head (shira) is considered the seat of the mind and is one of the tri-marma (three vital points). Shirodhara is therefore regarded as especially beneficial in conditions of mental imbalance (manasika vikaras), which are believed to arise from the vitiation of raja and tama doshas⁴.

2.1 Symptoms of ADHD

2.1.1 Hyperactivity⁵

- Children with ADHD often display continuous movement such as running, climbing, fidgeting, rocking on chairs, or frequently tapping and touching objects or people around them.
- They commonly find it difficult to relax or fall asleep and may struggle to “switch off” even at night.
- Both children and adults with hyperactive symptoms often need to stay active to maintain focus — for example, pacing while talking on the phone or feeling uncomfortable sitting still for long periods.
- They may multitask excessively, such as working on several computer tabs at once or reading while watching television.
- There is often a persistent inner drive to stay busy or keep moving, which helps them feel focused or alert.

2.1.2 Impulsivity

- Individuals with ADHD often act spontaneously without fully considering the consequences of their actions. This impulsive behavior has been associated with altered limbic system signaling and is more commonly observed in children, though it may lessen with maturity.
- Many affected individuals also exhibit a reduced awareness of potential danger, which contributes to risk-taking behaviors.

- Some children show diminished pain sensitivity or an unusually high pain threshold, influencing how they process rewards and consequences. However, such neuropsychological features are not exclusive to ADHD and can also be observed in other developmental conditions, such as autism spectrum disorders.
- In children, impulsivity may appear as excessive talking, interrupting others, difficulty waiting for their turn, classroom disruptions, or dominance in group activities. They may also become easily frustrated, overexcited, or quick to anger.

2.1.3 Inattention.

- Individuals with ADHD often struggle to maintain focus and may easily shift from one activity to another without completing tasks. They frequently need reminders or written lists to stay organized and prevent forgetfulness.
- They may make hasty judgments or overlook important details because they fail to give full attention to a situation or task.
- In children, this commonly presents as zoning out or daydreaming during lessons, while adults may lose focus during conversations or tasks and appear mentally disengaged for extended periods.

2.2 Diagnostic Criteria, Assessment and Classification⁶

2.2.1Diagnosis

Attention-Deficit Hyperactivity Disorder (ADHD) is classified into three clinical presentations: predominantly inattentive type, predominantly hyperactive/impulsive type, and combined type, which includes symptoms from both domains.

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR), the diagnosis of ADHD requires the presence of six or more symptoms from either the inattention or hyperactivity/impulsivity categories, or from both, persisting for at least six months (refer to Table 1). In preschool children, hyperactivity is usually the most noticeable feature, while inattention tends to become more apparent between 5 and 9 years of age.

For adolescents and adults, the threshold for diagnosis is reduced to five symptoms in either domain. Additionally, the symptoms must have been present before 12 years of age and evident in two or more settings such as home, school, work, or social environments. To confirm a diagnosis, these symptoms must significantly impair academic, occupational, or social functioning and cannot be better explained by another psychiatric or medical condition.

Table 4.1: DSM-5-TR Attention Deficit Hyperactivity Disorder system by Domain

Inattention	Hyperactivity and Impulsivity
Often fails to provide close attention to detail or makes careless errors in schoolwork ,at work or during other activities	Often fidgets with or taps /feet or fidgets in seat
Often has difficulty focusing on tasks or activities	Often leaves seat in situations when is it expected to remain seated
Often does not seem to be listen when spoken to directly	Often inappropriately runs around or climbs in situation
Often falls to follow through on instructions and fails to complete schoolwork, chores or dudies	Often cannot play or engage in lesisure activites quietly
Often has difficulty organizing and managing tasks and activities	Often is on the go
Often avoids, dislikes, or is hesitant to participate in tasks requiring sustained mental effort	Talks excessively often
Often loses items necessary for tasks or activities	Shouts out an answer before a question has been completed often
Forgetful in daily activites often	Interrupts or intrudes on other often

2.2.2 RATING SCALES

- Several ADHD clinical questionnaires and rating scales based on the DSM are available to assist clinicians with diagnosis and follow-up assessments after therapy is initiated. The use of parent-reported or teacher-reported behavior-rating scales began in the late 1960s. Today, there are clinician-, parent-, self-, and teacher-reported rating scales.
- The ADHD Rating Scales, Conners Rating Scales, and National Institute for Children's Health Quality Vanderbilt Assessment Scales are commonly used in practice for preschool-age children to adolescents.
- clinicians should ensure they are using the appropriate rating scale for the patient's age, the person completing the scale, and purpose.
- The scales assist with ADHD diagnosis by converting subjective symptom information into objective data and then allow an objective manner for follow-up. The scale can also identify the subtype of ADHD.
- Providers can compare the objective outcomes to prior ratings to evaluate for symptom improvement or worsening over time.
- Additionally, the provider can objectively evaluate symptoms in different settings if the parent and teacher complete forms

2.2.3 CLASSIFICATION

- Mild ADHD is classified in the DSM-5-TR as the patient having few, if any, symptoms in excess of those required to make the diagnosis are present, and symptoms result in no more than minor impairments in social or occupational functioning.
- Severe ADHD is classified "many symptoms in excess of those required to make the diagnosis, or several symptoms that are particularly severe, are present, or the symptoms result in marked impairment in social or occupational functioning."
- Moderate severity is described as symptoms or impairment between the mild and severe classifications.

2.3 TREATMENT

2.3.1 Occupational therapists (OT)

Occupational therapists play a vital role in the multidisciplinary management of children with ADHD. They work collaboratively with parents, teachers, and other professionals to develop an individualized sensory regulation plan, often referred to as a sensory diet. This plan helps the child maintain balance by providing calming activities when they are overstimulated and alerting activities when they are underactive or disengaged. The primary objective is to help the child achieve optimal sensory and emotional regulation, promoting consistent functional performance throughout the day. Occupational therapists also design activities that stimulate the motor cortex, thereby improving attention span, focus, and overall behavioral control.

2.3.2 Neurofeedback

Aims to strengthen connections between the limbic system and the prefrontal cortex. The children are encouraged to move objects on a screen with their mind while hooked up to a monitor and headset and find it great fun. A metanalytical study recommended training for practitioners and the furthering of standard protocols.

2.3.3 Delayed gratification

Parents and caregivers are encouraged to implement strategies that promote delayed gratification in children with ADHD. Research indicates that with consistent practice, the brain's neural circuits involved in self-control and reward processing can be strengthened through such exercises.

A well-known example is the "marshmallow test," in which children receive a larger reward if they can wait rather than taking an immediate smaller one. This principle has been successfully adapted for home and classroom use to help children practice patience and self-regulation.

For instance, when a child requests attention, screen time, or a treat, they may be given a "wait card" with a specific time duration (e.g., 5, 10, or 15 minutes). If they manage to wait for the set time, they receive a slightly greater reward than initially expected. Over time, this consistent reinforcement helps children gradually extend their waiting periods and develop improved impulse control.

2.3.4 Motor Cortex Engagement

In school teachers can consult with occupational therapists and psychologists to have a movement arsenal for children with ADHD. Such things as putting elastics across the base of their chair means they can be hopping and popping when they need to concentrate or with wriggle cushion on the seat, fidget spinners, activity finger cubes. Understanding of the child's need to engage their motor cortex in order to access higher thought processes is crucial. Taking movement or sensory breaks is another way to support children with ADHD traits, as in the Movi-Kids intervention.

2.3.5 Social and Communication Skills

Children with ADHD often require structured social skills programs to enhance peer interaction and emotional understanding. Due to impulsivity and hyperactive behavior, they may struggle with turn-taking, empathy, and maintaining friendships. Guided social training helps them learn appropriate communication patterns, respect for others' boundaries, and cooperative play, which collectively improve social confidence and peer relationships.

2.3.6 Counselling and Psychotherapy

A combination of counselling approaches has been found beneficial in managing ADHD. Collaborative efforts among families, schools, and the community are essential to provide consistent behavioral support. Techniques such as play therapy, family therapy, and cognitive behavioral therapy (CBT) have shown positive effects in improving emotional regulation, self-awareness, and adaptive coping mechanisms. These interventions aim to strengthen the child's self-control and enhance their functioning across different environments.

2.3.7 Medication

Pharmacological treatment is often recommended when behavioral and psychosocial interventions alone are insufficient. Research has shown that targeting specific neurotransmitter systems in the brain can help regulate attention, impulse control, and activity levels. Psychiatric evaluation is typically required to determine the most suitable medication and dosage. Commonly prescribed drugs include stimulants (such as methylphenidate and amphetamines) and non-stimulant agents (such as atomoxetine, guanfacine, or clonidine). These medications aim to restore neurotransmitter balance and improve overall concentration and behavior.

2.3.8 SHIRODHARA⁸

Shirodhara is an ancient Ayurvedic therapy that forms an integral part of the Panchakarma procedures. In this treatment, a continuous stream of liquid is gently poured onto the forehead and allowed to flow across the scalp from a defined height. Depending on the medicament used, different forms of Shirodhara are performed — such as with Taila (medicated oil), Takra (buttermilk), Kshira (milk), or Kwatha (herbal decoction).

When medicated oil or ghee is used, the procedure is specifically termed Taila Dhara, which belongs to the broader category of Murdha Taila therapies. The four principal types of Murdha Taila are Abhyanga, Seka, Pichu, and Basti, each described as “Uttarottara Gunaprada”, meaning progressively more beneficial in their therapeutic effects. Thus, Shirodhara represents a specialized form of Murdha Taila designed to promote relaxation, stabilize the mind, and enhance overall neurological balance.

2.3.8.1 Indications

Classical Ayurvedic texts describe Shirodhara as a beneficial therapy for a wide range of disorders. It is traditionally indicated in conditions such as Shiroroga (head diseases), Anidra (insomnia), Chittodvega (anxiety), Manoavasada (depression), Unmada (psychotic disorders), Twakroga (skin diseases), Vepathu (tremors), and other Manasika Rogas (mental or psychological disorders) including Apasmara (epilepsy).

In modern clinical practice, Shirodhara is recommended for patients suffering from migraine, facial palsy, paralysis, jaw stiffness, ocular discomfort, anxiety neurosis, and sleep disturbances. It has also shown

effectiveness in managing stress-related conditions, psychosomatic illnesses, and various neurological disorders such as epilepsy, chronic headaches, and mental health conditions like insomnia and psychosis. Additionally, it is found beneficial in certain dermatological disorders including eczema and psoriasis, which often have a psychosomatic component..

2.3.8.2 Contraindications

Kaphaja Vikaras- Shirodhara further increases Kapha, which makes the disease difficult to cure. It is also contraindicated in those who have just undergone Sudhikarma; (purification through Panchkarma) and those who are suffering from Ajeerna/indigestion.

2.3.8.3 Method of Pouring of a Liquid (Shiro-Dhara)

2.3.8.3.1 Purvakarma:

Pre-operative Procedure Purva Karma is related to the preparation of the patient. First, it should be confirmed whether the patient is fit for Shirodhara or not. The following equipment should be required.

Droni- (Dhara table)

Dhara Patra- (Shirodhara pot)

Dharavarti- a wick of loose cotton thread

Suitable oil- 1.5 liters.

Other requirements like cloth piece, cotton, pot, Rasanadichurna etc. The hair of the patient on the scalp should be removed if the patient permits. The patient should pass stool and urine. Then patient's pulse, temperature and blood pressure should be recorded.

Position of the Patient

For Shirodhara, the patient is positioned comfortably in the supine posture. The Dhara Patra (vessel) is suspended approximately 4 inches above the forehead. The eyes and ears are protected with cotton plugs to prevent the therapeutic liquid from entering them. The head is slightly elevated, ideally resting on a wooden support. Before beginning the procedure, about 10 ml of oil is applied to the scalp, followed by a gentle Abhyanga (oil massage) over the face, neck, shoulders, and chest to enhance relaxation and promote uniform flow of the liquid.

Aushadha (Drug) should be selected according to the disease and vitiated dosha. The quantity required is above 1 to 2 kg.

Sneha mentioned according to the condition of Doshas are

Vata Dosha: Tila Taila, Vataghna liquid

Pitta Dosha: Ghrita, cold water

Kapha dosha: Tila -Taila, not too hot, not too cold water

Rakta Dosha: Ghrita with cold water

Vata + Pitta + RaktaDosha: Ghrita + Taila in equal proportion

Vata + Kapha + RaktaDosha: ½ part Ghrita + 1 part TilaTaila

2.3.8.3.2 Pradhana karma

The selected liquid should be kept in the vessel and should be poured continuously and slowly on the forehead of the patient. A mild oscillation should be given to maintain the flow all over the forehead. This liquid gets collected in the vessel, which is kept below the table, when the liquid in the vessel gets emptied, then it is replaced by the lower vessel. Oil should be heated up to 40°C and poured into the Dharapatra.

Dharakala: Timing :The patient has dryness and Pittayukta Vata, the period is 2½ Prahara or 2 Prahara and in Snigdha Kaphayukta Vata it is one Prahara, or it should be up to perspiration initiate. But nowadays generally it is to be done for 45-60 minutes depending on the condition of the patients. The patient has to remain in a lying posture on his back. Depending on the nature of the disease and the physical condition of the patient, the treatment can be done daily for 7 to 14 days. Generally, treatment is done in the morning hours preferably between 7 to 10 a.m.

When milk is used for Parisachana it should be changed every day. When Dhanyamla is used, it can be used for up to 3 days. Oil should also be changed in 3 days. In the first 3 days; half of the oil is used, for the next 3 days later half of its used and on the 7th day all the first and second half are mixed, then it should be discarded. Shirodhara can be performed daily or on alternate days in a person of strong strength (Uttam Bala

Purush), with an interval of four days in a person of very weak strength (Heena Bala Purush). The temperature of The Drava is approximately 40°C or it should be Sukhoshna near about to body temperature.

2.3.8.3.3 Pashchata karma

After completing Shirodhara the oil from the head should be removed by a piece of cloth. Rasnadichoorna should be applied over the head. His eyes should be washed with cold water, and he should remove his cough. He should take the mild wind. He should rest for some time. Then remaining oil of the Dhara should be massaged on the body. Then he should take bath with hot water. Then he should take perfume and a light diet and he should drink water, which is Siddha with Vatanashaka Aushadhi. He should take the hot meal. He should take Pathya for up to 7 days.

For drinking purposes, warm water boiled with Dhanyajiraka, ginger and cumin seeds may be used. Only hot water should be used for washing purposes.

The patient should avoid physical exertions, and mental excitement such as anger, grief etc. and exposure to cold, sun, dew, wind, smoke, or dust should also be avoided. Riding a high-speed vehicle, walking, speaking too long or too loud and other actions that may give any strain on the body and mind must be avoided. Sleeping during the daytime and standing continuously for long period must also be avoided. It is also advisable to use a pillow that is neither very high nor very low, during sleep at night. It is advised to take Takra or Yusha prepared by adding black piper and ghee etc and used Hitakarak laghu ahara.

III. DISCUSSION

Shirodhara, a classical Ayurvedic therapy involving continuous pouring of warm medicated oil or liquid on the forehead, is traditionally described to induce relaxation and mental clarity. From a modern perspective, it may influence neurophysiological pathways relevant in ADHD.

Continuous tactile and thermal stimulation activates trigeminal afferents, modulating hypothalamic and limbic circuits, producing parasympathetic predominance and reducing cortical hyperarousal⁸. EEG studies indicate *Shirodhara* induces an “alert-calm” state with increased alpha/theta activity and reduced beta dominance⁹, which may be beneficial since ADHD shows abnormal theta–beta ratios and impaired frontal cortical control¹⁰.

Shirodhara also appears to normalize HPA axis activity, lowering salivary cortisol and stress markers¹¹, relevant because ADHD patients often show heightened stress reactivity¹². Improvements in sleep quality reported after *Shirodhara* may further enhance attention and emotional regulation¹³. Oils used (e.g., *Brahmi*, *Jatamansi*, *Ashwagandha*) possess documented neuroprotective and nootropic effects that can support cognition and behavior regulation¹⁴⁻¹⁵.

Preliminary clinical evidence suggests that *Shirodhara*, when combined with *Ayurvedic* medications, improved attention and reaction time in children with ADHD compared to standard therapy alone¹⁶. However, these findings require validation in larger randomized controlled trials.

IV. .CONCLUSION

Attention-Deficit/Hyperactivity Disorder (ADHD) presents significant challenges in pediatric practice due to its multifactorial pathophysiology and the limitations of pharmacological therapy. Evidence from emerging clinical and experimental studies suggests that Shirodhara is a highly promising adjunctive therapy for ADHD. By modulating cortical activity, balancing autonomic responses, normalizing stress hormones, improving sleep, and delivering neuroprotective effects of medicated oils, Shirodhara directly addresses several neurobiological disturbances associated with ADHD.

When combined with behavioral therapies, Shirodhara has shown encouraging outcomes in improving attention span, emotional regulation, and reducing hyperactivity. This integrative approach not only enhances therapeutic efficacy but also provides a safe, non-invasive, and holistic management option for children with ADHD.

Therefore, Shirodhara can be considered a very effective supportive therapy in ADHD management, with the potential to significantly improve quality of life. Future large-scale clinical trials will further strengthen its position as a valuable component of comprehensive ADHD care.

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