



## Review Article

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### MANAGEMENT OF ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) THROUGH PANCHAKARMA

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#### ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD) is among the commonest childhood neurological disorders affecting the focusing, behaviour and activity controlling abilities. This disorder not only influence the learning abilities of the child but also has a significant impact on patient's social, professional and family life, affecting their relationships with parents and siblings, causing disruption at work because of decreased concentration abilities and less stable relationships thus crippling the self-esteem in every aspect. The prevalence of the disease is increasing and treatment options are just limited to the management of symptoms and that too not very efficient, no permanent cure is reported till date. So, there is need to expand the treatment modality. In Ayurveda, it can be correlated with various types of abnormal behaviours due to increased Vata and symptoms arising due to imbalance in the homeostasis between the components of Prajya (intellect). The relaxation and concentration improving Panchakarma therapies along with Vedic chant recitation (Music Therapy) for enhancing the concentration and focussing abilities can be proved as a promising treatment in the management of ADHD.

**Keywords:** ADHD, Neurological disorder, Panchakarma, Prajya.

#### INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is defined as a problem of not being able to focus, being overactive, not being able to control behaviour, or a combination of these. For these problems to be diagnosed as ADHD, they must be out of the normal range for a person's age and development.

The mean worldwide prevalence of ADHD is between 5.29% and 7.1% in children and adolescents (<18 years).<sup>1,2</sup>

The prevalence of ADHD in India among primary school children was found to be 11.32%. Prevalence was found to be higher among the males (66.7%) as compared to that of females (33.3%). The prevalence among lower socio-economic group was found to be 16.33% and that among middle socio-economic group was 6.84%. The prevalence was highest in the age group 9 and 10 years.<sup>3</sup>

**Diagnostic Criteria-** The two main guidelines used for the diagnosis of ADHD are DSM-V<sup>[4]</sup> and ICD-10.<sup>[5]</sup> DSM-V criteria is followed more because of its broader spectrum.<sup>6</sup>

#### DSM-V Criteria for ADHD <sup>7</sup>

In making the diagnosis, children should have six or more symptoms of the disorder and people above 17 should have at least five symptoms.

#### The Criteria of Symptoms for a Diagnosis of ADHD

Inattentive presentation:

- Fails to give close attention to details or makes careless mistakes.

- Has difficulty sustaining attention.
- Does not appear to listen.
- Struggles to follow through on instructions.
- Has difficulty with organization.
- Avoids or dislikes tasks requiring a lot of thinking.
- Loses things.
- Is easily distracted.
- Is forgetful in daily activities.

Hyperactive-impulsive presentation:

- Fidgets with hands or feet or squirms in chair.
- Has difficulty remaining seated.
- Runs about or climbs excessively (in children); extreme restlessness (in adults).
- Difficulty engaging in activities quietly.
- Acts as if driven by a motor; adults will often feel inside like they were driven by a motor.
- Talks excessive.
- Blurts out answers before questions have been completed.
- Difficulty waiting or taking turns.
- Interrupts or intrudes upon others.

Combined inattentive & hyperactive-impulsive presentation:

- Has symptom from both of the above presentations.

**Based on the types of symptoms, three kinds of ADHD can occur**

Combined Presentation: If enough symptoms of both criteria inattention and hyperactivity-impulsivity were present for the past 6 months.

Predominantly Inattentive Presentation: If enough symptoms of inattention, but not hyperactivity-impulsivity, were present for the past six months.

Predominantly Hyperactive-Impulsive Presentation: If enough symptoms of hyperactivity-impulsivity but not inattention were present for the past six months.

**Disease Pathogenesis**

**a. Structural and functional abnormalities in brain**

Brain imaging studies have revealed that, in youth with ADHD, the brain matures in a normal pattern but is delayed, on an average by about 3 years.<sup>8</sup> The delay is most pronounced in brain regions involved in thinking, paying attention, and planning. More recent studies have found that the outermost layer of brain, the cortex, shows delayed maturation overall,<sup>9</sup> and a proper communication between the two halves of the brain shows an abnormal growth pattern.<sup>10</sup>

**b. Functional abnormalities**

The MRI shows, reduced activity levels in various areas in frontal regions of the brain of ADHD patients, including the anterior cingulate, prefrontal and orbito-frontal cortices.<sup>11</sup> Reduced levels of activity have also been observed in basal ganglia, thalamus and parietal cortices. The Frontal Lobe/Prefrontal Cortex helps us to focus, make good decisions, plan ahead, and learn and to remember what we have learned.

The reduction in brain activity may have potential impact on various cognitive and behavioural traits associated with ADHD, such as inhibitory control, selective attention and decreased working memory.<sup>12</sup>

**c. Chemical abnormalities**

ADHD is associated with abnormalities in the neural systems that govern release of neurotransmitters such as dopamine (DA) and noradrenaline (NA).<sup>13,14,15</sup> The DA is thought to influence behaviours such as impulsivity,<sup>15</sup> and NA is thought to control attention, arousal and mood.<sup>16,17,18</sup> The patients with predominantly inattentive ADHD had changes in their norepinephrine transporter gene, which affects norepinephrine levels in their brains. Patients with predominantly hyperactivity-impulsive ADHD had changes in their dopamine transport gene, thus affecting dopamine levels in the brain.

In Ayurvedic texts, though there is no clear-cut description of any disorder matching that of Attention deficit hyperactivity disorder but, it can be correlated with various abnormal behaviours which are described in the texts as- Anavasthita Chittatva -Charak Sutra Sthana Maharoga Adhyaay

Manovibhrama -Charak Samhita Unmaad Nidan- 7/5

Buddhivibhrama -Charak Samhita Unmaad Nidan-7/5.

Smritivibhrama -Charak Samhita Unmaad Nidan- 7/5

Sheelavibhrama -Charak Samhita Unmaad Nidan- 7/5

Cheshtavibrama -Charak Samhita Unmaad Nidan- 7/5

Acharavibhrama -Charak Samhita Unmaad Nidan- 7/5.

In ADHD, 'Mann' (mind) is affected and as it is the function of Mind to have control on all the sense organs and itself<sup>19</sup> so, the function of all the sense organs is hampered. Also, there is vitiation in all the components of Prajya (intellect) i.e. Dhee, Dhriti and Smriti. Dhee is the understanding and discriminating capability between beneficial and non-beneficial, Dhriti controls all the factors whereas Smriti is the recollection of thoughts. Hyperactivity or impulsivity is a result of Dhee vitiation which affects the capability of the child to differentiate between good or bad so it is hard for him to discriminate between useful and useless tasks. Dhriti vitiation prevents the child from staying at one task that leads to continuous purposeless tasks and Smriti vitiation causes inability to learn from the past experiences. Among Sharirika Doshas there is vitiation of Vata which is the Pravartaka (initiative factor) of all Cheshta (activity) (Sharirik- hyperactivity and Manasik- impulsive) and controller of mind and all the sense organs.<sup>20</sup>

**MANAGEMENT**

**Panchkarma in ADHD**

**Abhyanga (Oleation Therapy or Massage)** –Abhyanga is a form of Ayurvedic therapy which involves massaging the whole body with warm medicated oils. Oleating the body helps in pacification of Vata,<sup>21</sup> which is responsible for hyperactive behaviour in ADHD patients. Massage therapy has been studied in a number of medical and psychiatric illnesses with positive results and can be successfully used in ADHD patients as it has also been shown to increase serotonin levels which might help modulate elevated dopamine levels thought to occur in children with ADHD<sup>22</sup>. Amplified vagal tones (and therefore, amplified parasympathetic activity) have been eminent throughout massage therapy, and this intensification is frequently linked with improved attentiveness and an extra relaxed state.<sup>23</sup> A recent study showed massage therapy to decrease fidgeting and improve scores on the Conners Scale (Conners, 1995) in adolescents with ADHD.<sup>24</sup> Thus, massage therapy can help the ADHD patients by improving the symptoms and breaking the pathophysiology of disease.

**Murdha Taila / Sira Tarpana** – Murdha Taila or Application of oil to the head is a procedure of Extra-cranial drug administration through oleation. It is the procedure of anointing the head with oil. It consists of four different procedures, any one of which can be used for the purpose.

- a) Shirodhara
- b) Shiropichu
- c) Shiro-abhyanga
- d) ShiroBasti

These all procedures comprise of application of medicated oil on the head following a slight massage. Application of oil as- Chandan-bala-lakshadi, Ksheerbala, Ashwgandha in head causes the pacification of Vata which is responsible for the impulsive behaviour and it is also told as Indriya-prasadana (sense organs able to function normally).<sup>25</sup> In a study, significant brain functional activation changes together with increased cerebral blood flow were observed in participants who received a massage. Massage was

found to reduce the level of stress related Serum Cortisol, arginine vasopressin and salivary stress protein chromogranin A with concomitant increase in circulating lymphocytes and cerebral blood flow.<sup>26,27,28,29,30</sup> All these procedures also influence hormonal and cerebral blood flow levels.<sup>31,32,33,34</sup>

These all factors may lead to improve the cerebral function, enhance the alertness and concentration abilities especially the Shirodhara, the relaxing and anxiolytic actions for which are well established. In a study carried out on ADHD patients the Shirodhara procedure helped in decreasing the auditory and visual reaction time and increasing the attention span (when measured using an electronic vernier chronoscope).<sup>35</sup> Hence, these procedures can lead to a state of alertness and calmness similar to the response observed in meditation.

**Vedic Chanting (Mantra) or Music Therapy-** When the body is stressed, cortisol levels are elevated. Yoga, chanting and breath work can be used to balance cortisol levels, synchronize the brain hemispheres, stimulate the frontal lobe (the area responsible for executive functioning, which is said to be faulty in ADHD), help regulate the hypothalamus, strengthen the adrenal glands and balance neurotransmitters. When we focus on something, the Alpha state (in EEG) predominates and productivity, learning, creativity and concentration all increase.

In addition, the auditory stimulus has the potential to provoke the cognitive abilities of the children and so the Vedic Chant therapy was found very efficient as Group therapy for the management of children with ASD.<sup>36</sup> The findings of the study suggest that chanting influenced both the hemispheres of the brain resulting in good memory and attention and hence with the same motive can be used in ADHD patients. Repeated and Continuous chanting may have influenced the increase in the level of attention by activating the cells in the brain. Music helps to reduce the activity of sympathetic nervous system and therefore reduce heart and respiratory rate which leads to a state of less anxiety and promote relaxation.<sup>37</sup> Hence, the practice of Vedic chanting in a traditional way can also be used as one of the powerful means as any other yogic practices like Asanas, Pranayama, or meditation in calming down the mind, enhancing memory and in effective improvement of attention.<sup>38</sup>

## CONCLUSION

ADHD is a disease of disturbed concentration which is a very common condition in children. Thus, it is very necessary to evolve some treatment methods and practices that could easily be performed on children. Also, there is a need to understand the Ayurvedic principles on Mann and Mansika Gunas as there are really important well laid principles on human psyche in Ayurveda and all the psychological activities are governed by those. The small numbers of studies regarding ADHD and Panchakarma management have definitely shown effects on the disease and thus pave way to further researches in employing Ayurvedic methods towards the treatment of neurological disorders. This field of study still remains a mystery and needs a lot to be done.

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