

## Attention Deficit Disorder: Anavasthita Chittata

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### Abstract

Attention deficit disorder (ADD) is one of the most common neurobehavioral disorders. It is first diagnosed in childhood and its symptoms often last in to adulthood. A person with ADD often avoids, dislikes, or does not want to do things that take plenty of mental effort for a long period of time. Till date there is no clear understanding about etiopathology, symptomatology and management of ADD in terms of *Ayurveda*. There is scarcity of literature on this topic in *Ayurveda*. The present article aims at better understanding of an *Ayurvedic* view of ADD. According to *Ayurveda* and *Yoga*, it is a well established fact that, *vata* influences the mind. *Vata* disturbance can cause instability of mind / wandering mind. *Anavasthita chittata* is a psychiatric condition caused by *vata prakopa* which resembles with ADD. *Dhriti vibhramsha* is the underlying pathological process of *Anavasthita chittata* which resembles with inattention of ADD. According to *Hatha yoga pradipika*, movement of *praana* leads to instability of mind. When *praana* is without movement, mind will also become steady. By this (steadiness of *praana*) the *yogi* attains steadiness of mind and should thus restrain the *vayu* (air). *Vata shamana chikitsa* of *Ayurveda* and meditation techniques of *Yoga* individually or together may provide satisfactory results in the management of ADD. There is a similarity found between ADD and *Anavasthita chittatvam*.

**Keywords:** Attention Deficit Disorder; ADD; Anavasthita Chittata; Meditation; Ayurveda; Yoga.

### Introduction

Attention deficit disorder (ADD) is one of the most common neurobehavioral disorders. It is first diagnosed in childhood and its symptoms often last in to adulthood. A person with ADD often avoids, dislikes, or does not want to do things that take plenty of mental effort for a long period of time. There is an inherent switching in the attention controlling mechanism of people with ADD [1]. Attention - deficit / hyperactivity disorder (ADHD) of the truly 'inattentive' sub type (ADD) is a different disorder from ADHD where hyperactivity is present. ADD appears to be an instance of childhood - onset 'dysexecutive syndrome'. ADD and ADHD are characterized by dissociable cognitive and behavioural profiles, different patterns of co

morbidity, different responses to medication, and different underlying neurobiological problems. The core cognitive deficit of ADD is in working memory. Individuals with ADHD of 'inattentive' sub type tend to be disorganized, easily pulled off course, forgetful and inattentive [2].

ADD in adults is a common but unheralded problem. Prevalence in children is 6% to 9% and 40% to 70% of these children will continue to experience symptoms as adults. 3% to 6% of adults have ADD symptoms and that interferes with vocational, social and family functioning.

People with ADD have poor psychosocial outcomes, school failure, and incarceration, work instability, substance abuse and high co morbid psychiatric disorders. ADD is frequently comorbid with depression, bipolar affective disorder, anxiety disorders, addiction problems, dysthymia and personality disorders [3]. Current literature suggests the presence of the following distinctive subtypes of the disorder, i.e., inattentive subtype (pure ADD), Hyperactive-impulsive subtype (classic ADHD), combing subtype and ADHD with co morbidities [4].

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### *What is ADD According to Ayurveda?*

There is no clarity regarding *Ayurvedic* concept of ADD. This creates a major diagnostic and management dilemma in clinical *ayurvedic* practice while approaching the case of ADD. Till date there is no clear understanding about etiopathology, symptomatology and management of ADD in *Ayurvedic* lines. As there is scarcity of literature regarding ADD according to *Ayurveda*, it leads to confusion about this disease and its clinical application. The present review is aimed to study the condition of ADD and to find out the relevant *Ayurvedic* condition (*Anavasthita chittata?*) for ADD.

### **Review Methodology**

*Ayurvedic* material related to '*Anavasthita chittata*' collected from major *Ayurvedic* texts with their commentaries like, *Charaka samhita*, *Sushruta samhita*, *Ashtanga sangraha*, *Ashtanga hridaya*, *Madhava nidaana* and *Sharangadhara samhita*. Electronic databases 'Google scholar search' and 'Google search' were searched for relevant studies and reviews published till September 2016, irrespective of their appearance / publication year. The key words used for search were, '*Anavasthita chittatvam*', 'Attention deficit disorder pdf' and '*Yoga in attention deficit disorder*'. Abstracts and full text articles which are freely downloadable and in English language were only included. Relevant *Ayurvedic* and *Yoga* material collected from the textbooks available at Parul institute of *Ayurveda* library.

### *Attention Deficit Disorder (ADD)*

The essential feature of Attention-deficit/Hyperactivity disorder is a persistent pattern of inattention and / or hyperactivity-impulsivity that is more frequently displayed and more severe than is typically observed in individuals at a comparable level of development. Inattention may manifest in academic, occupational, or social situations. 'ADHD with predominantly inattentive type' cases shows clinical features related to inattention predominantly compared to hyperactivity and / or impulsivity [5].

### *Etiopathology of ADD*

Genetics, neurotransmitter disturbances, prefrontal cortex dysfunction etc; are mentioned as the causative factors of ADD [3]. Primary disturbance in prefrontal cortex is also implicated in ADD. The primary neural circuits that are affected may be a

fronto-parietal one. ADD people may show slow information processing speed [2]. Dysfunction of cingulate, frontal and parietal cortical regions has been implicated in the patho physiology of ADHD by convergent data from a variety of sources [6]. The frontal lobe of the brain is very important part of complex cognitive processing system. It has many connections to different parts of the brain. People with ADD have shown that frontal lobe dysfunction may cause appearance of ADD symptoms. The frontal cortex plays an important role in controlling attention level, focusing, restraint and patience. When this part of the brain doesn't work well, signs of distraction, lack of restraint, impatience, and lack of attention to detail are seen in the person with ADD. The frontal cortex plays an important role in the excitation / inhibition balance in information processing. In people with ADD, frontal lobe dysfunction reduces the inhibitory power of the brain, and they have difficulties in inhibiting their switching of attention. In ADD, difficulties in sustaining attention and disorganization of attention controlling mechanisms are found [1].

### *Symptomatology of ADD*

ADD individuals are generally hypoactive, sluggish and have slow response speed. They do have primary deficit in working memory and tend to be overly self conscious, shy, withdrawn, passive too much, introverted, anxious and depressed. ADD persons may also suffer with reading, language deficits, and problems with mathematical calculations, under aroused and easily distracted. They tend to be bored and their problem mainly lies more in motivation rather than in inhibition [2].

ADD individuals make careless mistakes, and not good at paying close attention to detail. They have difficulty organizing their work, setting priorities, planning out a strategy and remembering to do all required tasks. They also tend to have a hard time sustaining focused attention on a task or activity. They have difficulty in organizing things, sloppy, trouble keeping track of their belongings, forgetful, missing of an assignment or task, abstract thinking and problem solving difficulties. They tend to get bored with a task fairly quickly and often abandon a task unfinished, bouncing from one partially begun project to another. They may have a hard time keeping their mind on any one thing at a time. Often find their minds wandering, conscious attention looks so hard and aversive thus often try to avoid or procrastinate or forget or lose the things or assignments frequently [2].

Wender has identified 7 sub categories of ADD;

inattention, motor hyperactivity, impulsivity, disorganization, hot temper, emotional over activity and mood swings [7]. Hallowell and Ratey have identified a list of 20 behaviours characteristic of ADD i.e., frequently getting interrupts, acts on the spur of the moment, doesn't think through consequences, a sense of under achievement, difficulty getting organized, chronic procrastination or trouble getting started, many projects going simultaneously trouble with follow through, tendency to say what comes to mind without considering the timing and appropriateness, frequent search for high stimulation, intolerance of boredom, easy distractibility, trouble focusing attention, tendency to turn out or drift away, trouble to follow protocols, often creative, intuitive and highly intelligent, impatient, low tolerance to frustration, impulsive (verbal / action), worry needlessly or endlessly, insecurity or impending doom, mood swings, mood liability, restlessness, tendency toward addictive behaviour, problems with self esteem, inaccurate self observation and having family history of ADD or mood disorder [3].

#### Management of ADD

Integrated treatment approaches like initiating self esteem, suggesting behavioural changes, family intervention and support along with medications has provided best outcomes in children of ADD although there is a little evidence from studies of adults with ADD [3].

The frequency of Complementary and Alternative Medicine (CAM) use in children who have Attention Deficit Hyperactivity Disorder (ADHD) ranges between 12% and 64%. A majority 83% of care givers noted that the herbal therapy was the main source of drug treatment when it was used [8]. Alternative and complementary treatments are needed to optimize the therapeutic benefits in ADHD, even though there are effective pharmaceutical intervention which is far from satisfactory because of incomplete benefit, treatment failures, and troublesome side effects [9]. The use of CAM as a treatment for children diagnosed with ADHD is wide spread, but little is known on the effectiveness of many such therapies [10].

#### Anavasthita Chittata

'Anavasthita chittatvam' is one of the condition / disease among 80 types of *naanaatmaja vikaaras* of *vata* (diseases especially caused by the vitiation of *vata dosha*) by *Charaka Acharya* [11]. *Vata* (body humor which regulates the functions of nervous & musculoskeletal system) is having the *gunas* (qualities)

like *chalatvam* (movement) and *anavasthitvam* (unstable). '*Shivadas sen*' (commentator on *Charaka samhita*) has defined '*Anavasthita chittata*' as 'unstable mind' or 'wandering mind' [12]. Commentators on '*Ashtanga samgraha*' (classical *Ayurvedic* text written by *viddha Vagbhata*) also defined it as '*Vata vyadhi*' (disease caused by *vata dosha*) and it is characterized by 'fickleness of mind' or 'unstable mind' [13]. *Acharya Sharangadhara* also quoted this condition under 80 types of *vata vyadhi's* [14]. In all other *Ayurvedic* classical texts there was no explanation / description available on '*Anavasthita chittata*'. In *brihat trayee* (three major classical *Ayurvedic* texts, i.e., *Charaka samhita*, *Sushruta samhita* & *Ashtanga hridaya*) and *laghu trayee* (three minor classical *Ayurvedic* texts, i.e., *Madhava nidaana*, *Sharangadhara samhita* & *Bhava prakasha*) except counting *Anavasthita chittata* as one among 80 types of *vata vyadhi's* and defining it briefly as psychiatric condition characterized by 'unstable mind', there was no other information regarding its etiology, pathogenesis, signs & symptoms, prognosis and treatment is available. Various authors in this century have compared '*Anavasthita chittata*' with 'Affective / Mood disorder' superficially without going in depth [15,16].

#### Vata & Mind

*Anavasthita chittata* is a disease caused by *vata prakopa* (vitiating of *vata dosha*) and also it is a psychiatric condition (characterized by unstable mind). For better understanding this, the normal functions of *vata dosha* related to mind and its pathophysiological aspects are essential. Bodily humors can also influence the mind. Out of the three humors, *vata* is mainly responsible for the activities of the mind i.e., it is the controller and stimulator of mind and it is responsible for enthusiasm or motivation. *Vata*, which restrains and impels different mental activities, is responsible for the functional format of the mind. It appears to be the primary motive force in the body due to its control over all the functions of the body and life exists so long as *vata* exists in the body [17]. It is capable of moving swiftly throughout the body. It is powerful, capable of vitiating all other factors, has independent movement and its vitiation causes large number of diseases [18].

#### Nirukti of Vata

The word *vata* is originated from from the *Sanskrit* root "*vâ gati gandhanayoh*" [19]. The meaning of '*Gati*' is '*Prapti*' (to acquire, to attain) or *Jnana* (to know, to aware, to sense). '*Gati*' is also having certain other implications like '*Gamana*' [to move] or *Cheshta* [to

act]. The meanings of 'Gandhana' are *Utsaha* (to enthuse), *Prakashana* (to enlighten), *Suchana* (to inform against), *Gandhana* (to initiate, initiation, gesticular action) and *Prerana* (to excite, to stimulate). Thus the meanings of *gati*, and *gandhana* imply that *vata* is the biological force, which recognize, stimulate and control all the activities in the body.

### Properties of Vata

*Vata* is *Amurta* (not having shape) and *Asamghata* (spreading nature) due to the predominance of *Akasha* (ether) and *Vayu* (air), which makes its only inferable. It is *Anavasthita* or instable which explained as *chalatwa* (moving continuously) by *Chakrapadi*. This is responsible for the *Gati* [20]. *Vata* is *Syayambhu* i.e., self-existent and self originated [21]. It is *Yogavahi* due to which it projects the qualities of the associated humours. [22] The other properties are *Ruksha* (rough), *Laghu* (light), *Sheeta* (cold), *Khara* (hard), *Sukshma* (nano), *Vishada* (clear), *Daruna* (terrific), *Sheeghra* (quick) and *Bahu* (excess) [21,23, 24,25].

### Gati

*Vata* is the soul factor responsible for all the activities of the body and is the very life of all living beings.

"*Sarva hi cheshta vatena sa pranah praninam smrutah*" [26]

This is due to the *chala* (movement) property of *vata*, which is directional in nature that it moves from *manas* (mind) through the *cheshtavaha srotas* (motor pathways) to perform the motor activities and through the *samjnavaha srotas* (sensory pathways) for the sensory perceptions. Due to the *sheeghragati* [swift movement] *vata* is *Ashukari* [instantaneous in action] and radiates through the body in repetitive currents i.e. '*Muhushari*'. Three functional states of *vata* are, *Akupita* [equilibrium stage], *Sthanastha* [Normal habitat] and *Avyahata gati* [unimpeded course of activity] are necessary for the normal *cheshta* of *kaya* (body), *vaak* (speech) or *mana* (mind) and *vega pravartana* (movement of natural urges) which are carried out by five types of *vata* viz, *Prana*, *Udana*, *Vyana*, *Samana* and *Apana* [27].

*Prana vata* is endowed with the functions of respiration, sneezing, deglutition, spiting and belching [27]. *Udana vata* helps in verbal expression, effort, stimulation, vitality and complexion [28]. *Vyana vata* is responsible for the different kinds of movements like *Prasarada* [extention], *Akunchana* [flexion], *Vinamana* [bending], *Unnamana* [upward movement], *Tirryakgamana* [lateral movements],

circulation of *rasa* (lymph) and *rakta* (blood), outflow of sweat, [29] blinking of eyes, yawning, directing *shukra* (semen) in *yonis* (vagina) [28] and responsible for almost all motor functions [30]. *Samaana vata* is digestive in function and it is related to gastro intestinal movements [30] and *Apaana vata* is excretory in function and also in expulsion of *shukra* (semen), *artava* (menstrual fluid) and *garbha* (fetus) [29].

The *gati* of individual types of *vata* can be analyzed in terms of intensity, direction and the area/ site of action. *Vyanavata* possesses the fastest *gati* and called as *mahajava* [30] and *Sheeghrataragati* [28]. *Pranavayu* also possesses a faster *gati* when the functions like "*buddhi* (cognition), *indriya* (sensory organs), *mano dharana* (mind control)" etc. are concerned. In terms of direction, *Prana* is multi directional, *Udana* is upward, *Vyana* possesses horizontal direction along with upward and downward directions, *Samana* is also multi directional and '*apana*' is in downward direction [29]. Due to the continuous movement [*sadagati*] it is not possible to define particular positions [*sthana*] for *vayu* [29]. Still according their location and functions the area/site of activity can be understood.

### Gandhana

The *gandhana* word is more related to the functions of mind as it refers to the knowledge or information, which is gained through the sense organs. *Vata* stimulate all sense organs i.e. "*Sarvoendriyaanaam udyojagah*" [31]. In the process of perception, it moves from the sense organs to the *manas* through the *sajnavaha srotas* and then to the *buddhi* for the conclusive cognition by the *indriya buddhis*. *Vata* is the controller and stimulator of the mind i.e., "*Niyanta praneta cha manasah*" [31] and thus carry out the functions of *Indriyabhigraha* (controlling sensory organs) and *Swasyanigraha* (self control) and is responsible for the emotions like *utsaha* (motivation), *harsha* (happiness) etc. It is responsible for different higher mental functions also. Among the different types of *vata*, *prana vata* is endowed with the functions of *dharana* of *buddhi* (cognition), *hrudaya* (heart), *indriya*, *mana* and *dhamanis* (vessels). The word '*dharana*' is derived from the Sanskrit root '*dh*<sup>o</sup>' which means to exist, live, survive and *dharana* means preserving, protecting etc. Thus it maintains the normal functions of *buddhi*, *indriya*, *manas*, etc; [28, 30] *Udana vata* possess the functions related with *dhee*, *dhriti* and *smriti* (three faculties of perception & cognition) and *mano bodhanadi kriya* i.e., the arousal of mind, intellect, memory, etc; [28] The '*tantrayantradhara*' (*tantra*= body and *yantra*= parts) function of *vata* indicates the coordination of the

sensory and motor activities of the body to maintain its equilibrium. This integration is through *manas* due to its *ubhayatmakatwa* (dual nature i.e., sensory and motor). This is mainly done by *prana vata* by maintaining the sensory input, consciousness, initiation and wakefulness. It deals with the arousal of the entire body alerting the person maintaining attention.

#### *Pathophysiology of Anavasthita Chittata*

The *shariraka doshas* in vitiated form disturbs all the physiological and psychological functions of the body and produces the symptomatology according to their *vriddhi* (increase) or *kshaya* (depletion). This imbalance results in an excess of their normal functions or a decrease of their qualities respectively [32]. An abnormality in *vata* results in various types of manifestations. When it is aggravated it leads to emaciation, tremor, desire for hot substances, delirium, disturbance in sleep, loss of strength, constipation, disturbance of mind, impairment of sense faculties and also causes fear, anxiety, worries, bewilderment, humility and excessive talk, [31] different types of pains and various abnormal movements and *anavasthita chittata* or instability of mind [20].

Especially, the vitiation of *prana vata* causes impairment of the sense organs, [33] *udana vata* causes diseases of head, [29] *vyana vata* causes diseases of whole body and *chittotplava* or disturbance of mind, [33] *samana vata* produces *agnimandya* (loss of digestive capacity) and diseases of *pakwashaya* (colon), [33] and *apana vata* causes diseases of genital tract and excretory system [29]. *Prana vata* is the supporter of mental functions and *udana vata* is useful to generate memory.

#### *Jnaana-Prakriyaa (Process of Perception / Cognition) in Ayurveda*

According to *Charaka*, the empirical soul – *Aatma* – is endowed with the power of perception. It perceives things when it is associated with the mind, intellect, and sense faculties. Here *Aatma* is considered the ‘Perceptor’ or ‘Doer’ and it requires instruments or *Karana* to get the knowledge. These instruments are *Manas*, *Buddhi* (intellect) and *Indriya* (*Buddhindriya* and *Karmendriya*). If these instruments of perception are either absent or impeded, then there will be no perception. One cannot get the real reflected picture of an image from a mirror, which is covered, with dirt or from water, which is muddy. Similar is the case when the mind gets afflicted, initially the desire for knowledge comes in *Aatma*, which is then transferred to *Manas* [34]. *Manas* further in association with *Indriya* perceive the *Indriyaartha* or the object of

perception. This perception is purely mental in the beginning. The practical advantages or disadvantages are ascertained thereafter. The intellect, which determines the specific properties of the object, impels an individual to speak or act intelligently [35]. Thus, *Aatma*, *Manas*, *Indriya* and *Indriyaartha* are basic four components required in learning. Any altered function of these components will hamper the learning process.

#### *Components of Perception*

*Atma* (soul), *Manas* (mind), *Indriya* (sensory organs) and *Indriyaartha* (objects of perception) are the basic four components required in the process of knowledge (*Gnanotpatti*).

#### *Atma*

*Atma* is considered as one of the nine causative factors (*Kaarana dravya*) of universe. The combination of *Shareera* (body), *Indriya*, *Manas* and *Atma* is said to be ‘*Ayu*’ or life. This *Atma* is endowed with attributions like desire, hatred, happiness, misery, effort, consciousness, stability, intellect, memory, ego etc, out of these, *Dhee*, *Dhriti*, *Smruti* are essential components in the process of *Gnanotpatti* (information processing / perception / cognition).

#### *Dhee*

“*Pragna bhedah yashcha bahya adhyaatmikanam bhavaanam hitaahita paricheda vibhagakari*” [36]

*Dhee* is a type of *pragna* (Intellect) and its functions is ‘ability to take correct decision’ or ‘judgment capacity’ or ‘discriminative power’.

“*Dhee gnanam*” [37]

“*Dhee pragna*” [37]

*Dhee* is also considered as a type of *buddhi* or faculty of *buddhi*.

*Buddhi* is defined as a phenomenon by which knowledge is gained “*Budhyate anena iti buddhi*”. In *Charaka samhita*, terms like *buddhi*, *mati*, *medha*, *pragna*, and *gnana* are frequently used for intellect. *Ayurveda* identifies intellect as a separate entity that mostly functions in collaboration with *manas*. *Chakrapani* states that, *buddhi* gives an initiative for work to come to final conclusion after proper analysis [38] *Arunadatta* explains, “*Buddhi adhyavasaya roopa*”, [39] which means it, executes the work after looking for pros and cons. In the process of knowledge, *buddhi* plays a key role. The knowledge first gets attached to sense organs; afterwards it passes to the mind, then

to ego and ultimately reaches to *buddhi*. *Buddhi* interprets it. It looks for all the pros and cons, concludes and finally passes it to *Atma*.

#### *Dhriti*

“*Dhriti*” is considered as one of the *Atma lakshanas*.

“*Pranaapanou nimeshadya – – – panchatvam gatamuchyate*” [40]

“*Dhritistu niyamatmika niyantaaramatmanam gamayati*” [40]

*Chakrapani* commented *Dhriti* as, ‘*niyamaatmika*’ and ‘*niyanta*’ (controller); Our minds are unable to attend to every sight, sound, smell, thought, memory and action impinging on us at any given moment (*ekatva of manas*). Control refers to a person’s ability to guide the selective process by directing and organizing whatever attention capacity is available. Normal mental functioning requires an individual to select a limited number of stimuli to be processed at any given moment. The basis for selection needs to be maintained over sufficient time periods to provide coherence to both thought and action. Here control of attention resembles with the *niyamana* function of *dhriti*.

“*Dhritim aloulyena*” [41]

Here *dhriti* means “steadiness”, or “firmness”, the ability to be within the norms of righteousness. The goal is for the individual to maintain a standard of what is relevant, not to be distracted by irrelevant stimuli. Sustaining attention requires the necessary control to keep a goal in mind and not to be distracted by other events (*chapatvam*) including one’s own thought.

“*Dhriti manaso niyamaatmika buddhi*” [42]

Here *dhriti* is considered as a type of *buddhi*, which is having the capacity to control the ‘*Manas*’. The level of attention requires the ability to maintain a behavioural or cognitive set in the face of distracting or competing stimuli. Sustained attention resembles with ‘*mano niyamaatmika*’ function of *dhriti*.

“*Dhee dhriti smrutaya pragna bhedah*” [43]

*Dhriti* is considered as a type of *pragna* (*buddhi*) or it is considered as a ‘faculty of intellect’.

“*Dhriti mana santhushti, anye niyamaatmikam buddhimahu*” [44]

*Dhriti* is commented as, ‘mental happiness’ or ‘controller of *manas*’.

“*Dhriti akaryaprasaktam mano nivartayati svaroopena*” [45]

Here *svaroopa* (nature) of *dhriti* is explained.

*Akaryaprasaktam* - Irrelevant stimulus or focus

*Nivartayati* - Diversion

So *dhriti* diverts the mind from irrelevant focus or stimuli to relevant focus or stimuli. This function of *dhriti* is resembles with ‘selective attention’ or ‘focused attention’.

“*Dhairyam dhriti chetasah sthiratvam achapalam*” [36]

*Dhriti* or *dhairyam* brings the stability to the mind. Here also the function of *dhriti* resembles with attention. *Dhriti* is the controlling factor, which prevents the mind from indulging in harmful and non beneficial objects. That is why the importance of association of *dhriti* with mind has been stressed under the function of mind in the context of *swanigraha* (self control). Thus *dhriti* helps to maintain attention and concentration which are very important in the process of *gnanotpatti*.

#### *Smruti*

*Smruti* or memory plays a vital role in the process of knowledge or *gnana prakriya* (information processing).

#### *Manas in Gnana prakriya*

The *atma* or soul is having consciousness but it is absolutely devoid of any action. The mind though unconscious, is possessed of action. However, the mind cannot act until it is joined with the soul. Therefore, the action of the mind, inspired by the consciousness of the soul is in fact superimposed on the soul itself. One can find from his own experiences that even if the sense organs are connected with their objects, it does not necessarily follow that the required understanding will always be there. Sometimes there is understanding and some other times it is not. This clearly shows that there is a sixth sense organ i.e. mind which determines the understanding of the object and but for which there is no understanding at all despite the contacts of the sense organs with their respective objects. *Charaka* states that things requiring thought, consideration, hypothesis, attention, determination or whatever can be known by means of the mind are regarded as its objects. Control of sense organs, self restraint, hypothesis and consideration represent the actions of mind.

#### *Indriya*

*Gnaanendriyas* or sense organs are just like the door

from which the object of perception are perceived and send inside towards *atma* through the mind. *Ayurveda* described two types of faculties – *gnaanendriyas* (sensory faculties) and *karmendriyas* (motor faculties) [46, 47, 48]. *Gnaanendriyas* are helpful in cognitive process and *karmendriyas* helpful in motor functions.

#### *Indriyārtha (Objects of Perception)*

*Artha* are the five basic objects of perception viz. *shabda* (sound), *sparsha* (touch), *roopa* (vision), *rasa* (taste) and *gandha* (smell), which are perceived from their respective sense organs. These are the basis of the *gnana prakriya*, as these are the only things to be perceived or learned with the help of *indriya*, *manas* and *atma*. All the external stimuli can be divided in to these five types. There remain some internal stimuli, which are perceived through *manas* as its own objects without the help of any other sensory faculty.

#### *Impairment of Gnana Prakriya (Process of Perception) in ADD/ADHD*

*Atma*, *manas*, *indriya* and *artha* are the links of *gnana prakriya* or process of perception. Any disturbance or impaired function of the components of this link will result in perverted knowledge, false knowledge or no knowledge at all. In ADD / ADHD, there may be impairment in function of one or more of the components of learning process.

#### *Dhee Vibhramsha*

In *dhee vibhramsha* the person unable to recognize what is good for him or what is bad and what is relevant and what is irrelevant etc; In ADD / ADHD also due to poor attention the child would continually respond to irrelevant stimuli and not be efficient in functioning.

#### *Dhriti Vibhramsha*

Function of *dhriti* is to divert the mind from irrelevant one's and to guide the mind towards relevant. Due to *dhriti bhrumsha* they will indulge in worldly enjoyments or it can't be restrained from harmful objects. In ADD / ADHD, the child unable to maintain a standard of what is relevant and easily distracted by irrelevant stimuli. So the child continually responds to irrelevant stimuli and not be efficient in functioning.

*Dhriti* is the controlling factor of *manas*. The basic nature of mind is mingling with its *arthas* and stimulating the *indriyas* but it is endowed with the

*karmas* called *indriyabhigraha* and *swasya nigraha*. '*Abhigraha*' means to 'catch', seize or assault i.e. *manas* is having power over the *indriyas* to direct them towards the particular *arthas*. At the same time it is having '*swasya nigraha*' or self control or restraint. When the mind functions normally it enable the flow of knowledge from a particular *indriya*, by cutting down the channels of sensory input from other unwanted stimuli which is called selective attention. If the *manas* is shifting its presence from one *indriya* to another, which irrelevant or unwanted, a normal *dhriti* controls the *manas* from indulging in such *indriyarthas*. Thus *dhriti* helps to sustain attention and concentration.

In ADD / ADHD due to this *dhriti bhrumsha*, *manas* is unable to sustain focus on particular *indriyārtha* and it is frequently shifting from one *indriya* to another *indriya* attending unwanted or irrelevant stimuli. Due to the impairment of the controlling factor (*dhriti*) over the *manas*, leads to the person indulging irrelevant tasks and dangerous activities. Analyzing these factors we can see that attention is a combined effect of *indriyabhigraha* and *swasya nigraha*, which are the *karma* of *manas* further controlled by *dhriti*.

#### *Mano Vibhramsha*

Control or direction of sense faculties and self restraint constitute the actions of mind. Even the restraint of the mind is possible only with the help of mind. The mind being always directed towards its objects cannot be taken away from the undesirable objects without *Dhriti*. *Dhriti* alone is capable of controlling, the mind. Here, *dhriti* it the instrument by means of which the mind controls itself. Impaired function of *manas* or perversion of mind leads the patient to think of such things, which are not worthy of thinking, and not to think of the things which are worthy of thinking. In ADD / ADHD due to the impairment of focused or selective attention, and sustaining attention the child may not be able to concentrate in his daily life activities. *Manas* afflicted with *rajas* (stimulatory factors) and *tamas* (inhibitory factors) will lead to so many emotional and behavioural problems.

#### *Buddhi Vibhramsha*

The normal function of *buddhi* is decisive cognition of the *indriyarthas* by the respective *indriya buddhi* and specific direction accordingly for requisite motor function or *cheshta*, either vocal or physical. In case of *buddhi vibhramsha* the person get lost himself in the *vishayaas* and take sudden decisions without

considering the consequences and situations i.e., a proper decisive cognition doesn't occur in response to a sensory stimuli and results in impulsive actions or thoughts. It is associated with the impairment of *dhruti* that should control particular *karmendriya* from performing the impulsive act. *Ati teekshnata, Amaatra ushnata, Bhaya, Krodha, Moha* etc., conditions resembles with impulsivity. Thus the child blurts out answers at wrong places, unable to wait for turn, often intrude on others, becomes aggressive, and often engages in dangerous activities.

#### *Vata Prakopa in ADD/ADHD*

*Gati* and *chalatva* are the properties of *vata* and it is the originator and executor of bio-motor functions through the *cheshtavaha srotas*, which is mainly done by *vyana* [27, 28]. So when it becomes vitiated *chalatva* increased and it causes excessive *manocheshta*, resulting in *kayacheshta* and *vaakcheshta* [31] and causes dysfunction all over the body [29]. The increased *cheshta* further vitiates *vyana vata* [33]. In the case of Hyperactivity in ADHD it is partly due to the response to the excessive and ill defined sensory input from many sources through *sangna vaha srotas*. Due to *manovibhrama* as *manas* is an *ubhayendriya* its impairment results in shutdown the pathways and the *cheshta vaha srotas* also pass varied information with the *sheeghragati* of *vata*. It results in the *atiyoga* of *karmendriya's* manifested as excessive *cheshta*, though it is purposeless or not goal directed. It is coupled by the impairment of *dhruti*, which should prevent the undesirable acts.

#### *Influence of Vata on Mind – Yogic Concepts*

“Chale vaate chale chittam nishchale nishchalam bhavate Yogi stanutvamaapnoti tato vayum nirodhayet”

When *praana* (life force / *vata*) moves, *chitta* (the mental force) moves. When *praana* is without movement, *chitta* will also become steady. By this (steadiness of *praana*) the *yogi* attains steadiness of mind and should thus restrain the *vayu* (air) [49]. *Praana* can never be motionless. The *praana's* are always moving and the mind is ever changing as well. These two highly mobile energies have to be brought in to a steady state [50]. *Praana* and mind are intricately linked. Fluctuation of one faculty leads to fluctuations of the other. When either the mind or *praana* becomes balanced the other is steadied. The mind is compared with wild monkey, jumping here and there. Because of this inborn tendency it is very difficult to hold the mind still. According to *Hatha yoga*, let the mind be, concentrate

on the autonomic body functions and vital energy, by that it will become quiet by itself. Concentrating on the breath, one can still the mind, develop one-pointedness and gain entry in to the deeper realms of the mind and consciousness. By becoming aware of the nature of the breath and by restraining it, the whole system becomes controlled. By retention of breath one can stop nervous impulses in different parts of the body and harmonizing the brain wave patterns. The longer the breath is held (retention), the greater the gap between nervous impulses and their responses to brain. When retention (*kumbhaka*) is held for a prolonged period, mental agitation is curtailed.

The breathing process is directly connected to the brain and central nervous system and it is one of the most vital processes of the body system. It also has some connection with the hypothalamus, the brain centre which controls emotional responses. The hypothalamus is responsible for transforming perception in to cognitive experiences. Erratic breathing sends erratic impulses to this centre and creates disturbed responses [49].

#### *Dhyaanam (Meditation)*

“*Dhyeyam bhaavana gnana vishayam*” [38]

“*Dhyeyam yat ekagrena manasa bhaovate*” [38]

Concentration or sustained attention on a given object is called “*dhyaanam*”. Here *dhyaana* refers to the effort, while *dhyeya* refers to the destination to be finally arrived at, through the abstract meditation. *Dhyeyam* is considered as one of the *artha's* of *manas*. Meditating with constant attention on the object is called as *dhyaana*. *Dhyaanam* resembles with concentration, without attention it is impossible.

#### *Dhaarana (Focused Attention/Sustained Attention)*

*Dhaarana* and *dhyaanam* both are the components of *ashtanga yoga*. Fixing one's mind on an external object, subtle or otherwise, like heart, lotus, nose or one's favourite deity is called *dhaarana*. After the practice of *yama, niyama, asana, and pranayama*, this becomes rather easy, especially after *pratyahaara*. The *sadhaka* who practices '*dhaarana*' according to the way shown by the *shastra* achieves *moksha*. It is easier to dance on the sharp edge of a sword than to practice *dhaarana* with a turbulent and bewildered mind. *Dhaarana* resembles with sustained attention.

#### *Role of Yoga in the Management of ADD/ADHD*

The use of *yoga* as a complementary treatment for



boys with ADHD appears to have some merit, especially for its evening effects when medication effects wear off. With *Yoga* and relaxation training, inattentiveness, hyperactivity, and impulsiveness have been reported to be reduced with consequent improvement in the ability to relax and focus more on learning [9]. *Sahaja yoga* meditation improves children's ADHD behaviour, self esteem and relationship quality. Children described better sleep patterns, less anxious, more able to concentrate, less conflict and parents of ADHD have felt happier, less stressed and more able to manage their child's behaviour. *Sahaja yoga* meditation is an effective management tool for family oriented treatment of childhood ADHD. [10] *Yoga* intervention is successful in reducing inattention and impulsivity and oppositional behaviour [52]. *Yoga* may become a promising alternative or complement to behavioural and medical interventions that are commonly used for children with attention problems [53].

Transcendental meditation techniques showed significant reductions in stress, anxiety and improvements in ADHD symptoms and executive function. TM technique may have potential as an effective non pharmacological intervention for managing the stress and anxiety associated with ADHD and impaired executive function, and may have a positive impact on behavioural symptoms associated with the disorder [54]. *Yoga* as therapy uses physical postures (*asanas*), breathing exercises (*pranayama*) and meditation techniques. Independently and/or comprehensively, these have been shown to improve several physiological functions and improve cognitive domains such as executive functions, attention, intelligence, memory and concentration [55].

Evidence from neuro imaging studies, showed enhanced activation and structural plasticity with meditation in fronto-parietal networks of internalized attention. Preliminary findings suggest that *sahaja yoga* meditation and mindfulness based meditation techniques could well be useful tools to enhance self control and concentration functions [56]. There is a scientific evidence to support a role for *Yoga* in playing an adjunctive value in ADHD. [57] Many studies from India have explored how *yoga* may influence visual and cognitive skills in children. These studies include changes in verbal and spatial memory, visual perception and executive functions. As a means of developing mental and physical discipline and self awareness, *Yoga* intuitively would have possible benefit for children with ADHD [58].

## Conclusion

According to *Ayurveda* and *Yoga*, it is a well established fact that, *vata* influences the mind. *Vata* disturbance can cause instability of mind/ wandering mind. '*Anavasthita chittata*' resembles with ADD. *Anavasthita chittata* is a psychiatric condition caused by *vata prakopa*. *Dhriti vibhramsha* is the underlying pathological process of *Anavasthita chittata* which resembles with inattention of ADD. *Vata shamana chikitsa* of *Ayurveda* and meditation techniques of *Yoga* individually or together may provide satisfactory results in the management of ADD. Further clinical trials on large sample are required to substantiate the present study claims.

## Key Message

Attention deficit disorder (ADD) is characterized by inattention which leads to the impairment in academic, social and occupational functioning. According to *Ayurveda* and *Yoga*, it is a well established fact that, *vata* influences the mind. *Vata* disturbance can cause instability of mind/ wandering mind. '*Anavasthita chittata*' mentioned in *Ayurveda*, resembles with ADD. *Anavasthita chittata* is a psychiatric condition caused by *vata prakopa*. *Dhriti vibhramsha* is the underlying pathological process of *Anavasthita chittata* which resembles with inattention of ADD.

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