

Role Of Ayurveda Therapy In Attention Deficit Hyperactivity Disorder In Children

Abstract:

Attention deficit hyperactivity disorder (ADHD) is a behavioural disorder characterized by a persistent pattern of inattention, hyperactivity, forgetfulness, impulsivity and distractibility affecting 5-10% of Indian population. Its aetiology is still obscure in modern science while on the basis of *Ayurvedic* etiopathogenesis we can say it may occur due to vitiation of *Dhee*, *Dhriti* and *Smriti* that causes imbalance of *kala* and *karma*, which results into improper contact of the senses with their objectives i.e *Asatmendriyarthasamyoga* and give rise to inattention, hyperactivity and impulsivity. Drug therapy for ADHD in modern medicine improve some academic skills but their side effects such as loss of appetite, weight loss, tics, mites, delirium, social withdrawal and obsessive compulsive disorder limits their use and on prolonged use develop abuses and addiction. **Need of study:** To find out supportive *Ayurvedic* modalities employed in the treatment of ADHD and to evaluate a safe, efficacious and side effects free treatment. **Conclusion:** *Medhya* drugs having *Vatashamak* property and posses nootropic, cognitive, neuroprotective properties are the main stay of treatment of ADHD as aetio-pathogenesis points towards involvement of *Mastishka* (brain) and *Vatadosha* with supportive *Panchakarma* therapy (*Shirodhara* and *Shiropicchu*) that calm down aggravated symptom of ADHD.

Keywords: ADHD, *Medhya* drugs, *Shirodhara*, *Siropicchu*

Introduction

Attention deficit hyperactive disorder is a neurobehavioral disorder of childhood and characterized by inattention, impulsiveness and hyperactivity. Behavioural and emotional disorders are now the leading cause of disability in children and adolescents^[1], among them Attention deficit hyperactive disorder (ADHD) is the most frequently encountered and most extensively studied neurobehavioral disorder of childhood. 5-10% of Indian populations affected by this disorder² with male predominance. Various recent studies have shown that ADHD is associated with significant impairment in multiple domains of child's functioning including a high frequency of psychiatric comorbidity with disruptive mood and anxiety disorder; poor education achievement and low occupational performance³, mal-adaptive interpersonal interaction and low self esteem.

Ayurvedic Perspective

In Ayurveda ADHD as an entity is not described. However, there are some references to abnormal behavior that can be correlated with ADHD, such as *Anavasthitachitta*, *Manovibhrama*, *Buddhivibhrama*, *Smritivibhrama*, etc discussed under the feature of *Vataprakriti*.^[4] Its aetiology is still obscure in modern science while on the basis of *Ayurvedic* etiopathogenesis we can say it may occur due to vitiation of *Dhee* (rational thinking), *Dhriti* (intellect/retaining power of the mind) and *Smriti* (memory) that causes imbalance of *kala* and *karma*, which results into improper contact of the senses with their objectives i.e *Asatmendriyarthasamyoga*^[4] and give rise to inattention, hyperactivity and impulsivity.

Aims and Objective

1. To find out supportive Ayurvedic modalities employed in the treatment of ADHD
2. To evaluate a safe, efficacious and side effects free treatment.

Material and Methods

The material for this review paper was collected from the *Ayurvedic* classics and articles searched through open med, Pubmed, Medlar.

Clinical and Experimental Evidences of Medhya Drugs

Medhya Rasayanas are group of medicinal plants described in *Ayurveda* with multi-fold benefits, especially to improve memory and intellect by *Prabhava*. These are *Mandukparni* (*Centellaasiatica* Linn), *Yashtimadhu* (*Glycyrhizaglabra* Linn), *Guduchi* (*Tinosporacordifolia* Linn), *Shankhapussi* (*Convolvulus Pleuricaulis* Linn).

1. *Yashtimadhu* (*Glycyrhizaglabra* Linn.)

It is mentioned in *Charak* as *Medhya Rasayan*. *Yashtimadhu* has *MadhurRasa*, *SheetaVirya*, *MadhurVipaka*, *Guru*, *Snigdha* in *Guna* and it is *Vata Pitta Shamak*.^[5] *Madhur* and *Shita* qualities, *Vatapitta Shamak*, and *Rasayan* effect of *Yashtimadhu* bring about soothing effect, and probably this helps in bringing about *Stairya* and *Dhriti* to establish stability of mind and for enhancing memory. Active ingredients are glycyrrhizin, flavones, isoflavones, glycyrrhetic acid,^[6] and six phenolic compounds. Experiments showed that *G. glabra* Linn. Increases the blood circulation to the CNS and balance the sugar levels in the blood.^[7] The isoflavones, glabridin and hispalglabridins A and B of *G. glabra* Linn. have significant antioxidant activity. That protects susceptible brain cells from the oxidative stress, resulting in improved neuronal function, thereby enhancing the memory,^[8] Improve learning and memory due to facilitation of cholinergic transmission in mouse brain.^[9]

2. *Mandukparni* (*Centellaasiatica* Linn.)

Mandukparni is *Medhya* by *Prabhava*, *Mandukparni* has *Tikta Rasa*, *SheetaVirya*, *MadhurVipaka*, *laghu* in *Guna* and it is *Vata Pitta Shamak*. It improves learning and memory processes by modulating dopamine, 5-Hydroxytryptamine receptor, and nonadrenaline system.^[10] It is also effective in preventing the cognitive deficits as well as oxidative stress,^[11] reduce stress by reduction in raised circulating corticosterone. It has neuronal dendritic growth-stimulating property; this may help in enhancing concentration power. Asiaticoside, an active principle present in *Ce.asiatica*, imparts anxiolytic activity, and thus helps in reducing the anxiety.

3. *Guduchi* (*Tinospora cordifolia*)

Guduchi, another component of *Medhya Rasayana*, has *Katu*, *Tikta* and *Madhura Rasa*, *Tikshna*, *Laghu*, *Ruksha*, *Sara*, *Guru* and *Snigdha*, *Guna* *Ushna Virya* and mildly *Sheeta Virya* and *Tridoshahara* property.^[12,13] Due to *Tridoshahara* property it helps to establish a balance and a good coordination of grasping, retention, and recall of memory. Further, *Rasayana Prabhava* helps in retaining things. The root extract of *Tinospora cordifolia* was found to possess normalizing activity against stress-induced changes in nor epinephrine, dopamine, 5-hydroxytryptamine, and 5-hydroxyindoleacetic acid level and enhances cognition (learning and memory). Cyclosporine-induced memory deficit was successfully overcome with *Tinospora cordifolia*.^[14] *Tinospora cordifolia*, enhances verbal learning, memory^[15] and have antioxidant activity,^[16] this helps in health promotion as well as preventing forthcoming diseases.

4. *Shankhapushpi* (*Convolvulus pleuricaulis*)

Shankhapushpi is the most effective among four *Medhya drugs* mentioned by *Acharya Charaka*. It has *Katu* and *Kashya Rasa* and *Guru*, *Sara*, *Snigdha*, *Picchil* in *Guna*, *Ushna Veerya*, *Madhur Vipaka* and *Tridoshara*. *Katu* and *Kashya Rasa* may enhance the alertness and quick understanding and retention of experiences. Phytonutrients help in brain stimulation and increase the ability to concentrate.^[17] *Convolvulus pleuricaulis* reduces anxiety and stress by controlling the production of body's stress hormones, adrenaline and cortisol possess anxiolytic, memory-enhancing, mood-elevating,^[18] as well as Neuroprotective effects.

Mode of Action of Medhya Drugs

On examination of the pharmacodynamics properties *Medhya* drugs most of drugs have mainly *Tikta, Katu, Kashaya, in Rasa Laghu, Guru and Snigdha Guna, Madhur Vipaka, Ushna and Sheeta Virya* and *Tridosh shamak property*.

Rasa: Analysis of Rasa present in *Medhya* drug reveals that the maximum numbers of drugs have *Tikta, Katu* and *Kashaya Rasa*. *Tikta* being predominant in *Akasha Mahabhut* and *Laghu Guna* increases the *Satva* part of *Mana*. *Kashaya Rasa* predominant in *Vayu Mahabhuta* and *Laghu Guna* increases *Satvik* property of *Mana*^[19] and decreases talkativeness by its *Vachana Nigrahanati* property. *Madhur Rasa* being predominant in *Parthiva Mahabhut* (*Sthairkara karma*)^[19] with *Guru* and *Snigdha Guna* increases *Medhya* effect and *Indriyaprasadana*.

Guna: *Laghu Guna* by virtue having same property increases *Sattva* part of *Mana* that enhances individual *Uttsaha* and *Sphurti*. By the *Prerna* property of *Sara Guna Prerana Karma* of *Vata* becomes normalized and attention span is improved. *Snigdha Guna* nourishes the brain.

Vipaka and Virya: *Madhur Vipaka* of *Medhya* drugs act as *Sarvadhaturvardhaka*, alleviate the *vitiated Pitta* and *Vata Dosha*. *Ushna Virya* also improves blood circulation to brain, as *ADHD* affected children have improper perfusion as well as glucose metabolism in the brain.

Doshagnata : In *ADHD*, vitiation occurs in *Vata Dosha* that simultaneously vitiates *Pitta* and ameliorates *Kapha*, *Kapha Vata Shamak* effect of drugs helps in breaking *Strotorodha* leads proper functioning of system, *Kapha Shamak* property have properties opposite to that of *Tama Dosha*, helps in dispelling the *Avaran* and normalizing *Tama Dosha*. *Tridoshashamak* effect of drugs brings homeostasis in *Tridosha* and *Triguna* as *Vata* and *Mana* interrelated with each other because *Vata* is responsible for vitiation of *Sharirika* as well *Manasika Dosha* and produce disease. Thus, these drugs regularize the functioning of *Mana, Sharira, Manasika Dosha, Dhi, Dhriti, and Smriti* that are primitive seat of pathology in the treatment of *ADHD*.

Effect of Panchakarma

1. Shirodhara

Pouring of any liquid / medicated liquid (milk, oil etc) over the forehead by specific technique is known as *Shirodhara*. When a constant stream of any liquid is poured over the forehead from a fixed height it results in pressure on the skin over the forehead. This pressure stimulates the pacinian receptors or the mechanoreceptors present on the skin, which in turn lead to mechanical deformation of the receptors, results change in the membrane potential of the receptor generated leads to generation of action potential, which is then passed to the cerebral cortex via brain stem. In this way the sensory information from outside reaches finally to the cerebral cortex. The pressure input from the skin over the head region is conveyed by the ophthalmic branch of trigeminal nerve to the reticulospinal neurons via a disynaptic pathway (Viana Di prisco et. al. 1995). Stimulated RAS generates L-block waves or the alert response and continuous practice of this process for 15 days may result in some long lasting effects. It is proved that responses evoked by stimulation of either the head or the tail were three or four times larger than those elicited by mid body stimulation (Gonzalo Viana Di Prisco et. al., 2000). Regular or continuous pressure input generates continuous impulse to the CNS thereby continuously stimulating the CNS. This mechanism is comparable to that of CNS stimulant medications advised to the *ADHD* patients.

In *Ayurveda*, the site, which the *Dara* stimulates, is the place of *Sthapani Marma* and *Marma* in *Ayurveda* is supposed as a junction of veins, arteries, nerves, joints/ sutures and the bones. *Sthapani Marma* control the 6th *Chakra* (*Agya*) and *Prana Vayu*. *Prana Vayu* control the activity of *Buddhi, Manas* and *Indryas*.^[20] Two *Charkas* viz.-the *Agya Chakra* (situated between two eye brows) and the *Bhramaraguhachakra* (situated at upper part of forehead) are supposed to be stimulated by *Shirodhara* which in turn produce their desired effect.

2. Shiropicchu

In *Shiropicchu* diffusion of the active ingredients of medicated oil occur through the skin of the site of anterior fontanel and get circulated all over the brain through the superior sagittal sinus and consequent C.S.F pathway which bring changes in the electric potentials of the brain compartments that lead to regularization of the neurotransmitter mechanism.

Discussion

Review of various clinical and experimental studies along with *Ayurveda* classics show that *Medhya* drug are having cognitive, memory enhancing, nootropic, learning aid, antioxidant, anxiolytic activity, neuro-protective properties in single as well as in compound form that brings homeostasis in vitiated *Tridosha* & calm down ADHD symptoms. *Yashtimadhu* by its *Rasa* and *Guna* helps in bringing about *Stairya* and *Dhriti* to establish stability of mind increases the blood circulation to the CNS, reduces oxidative stress, resulting in improved neuronal function and also have anxiolytic activity. *Madukparni* by its *Medhya Prabhava*, effective in preventing the cognitive deficits as well as oxidative stress, enhances concentration power, and anxiolytic. *Guduchi* due to its *Tridoshar* property helps in balancing of *Doshas*, improves good coordination of grasping, retention, and recall of memory, i.e correct *Asatmendriyarthasamyoga*, anxiolytic, normalizing activity against stress-induced changes in norepinephrine, dopamine, and enhances cognition (learning and memory). *Shankhapushpi* reduces anxiety and stress by controlling the production of body's stress hormones, adrenaline and cortisol, anxiolytic and have memory-enhancing effect and *Tridoshara*. *Shirodhara* and *Shiropicchu* may simply be a specific way of changing the excitabilities in dysfunctional circuits of the brain so that to make the individual to perform normally.

Conclusion

All above discussed *Medhya* drug (*Mandukparni*, *Yashtimadhu*, *Guduchi*, *Sankhapushpi*) used for stress reduction and improve cognition function due to these antioxidant, anxiolytic activities. *Panchakarma*(*Shirodhara* and *Shiropicchu*) that bring changes in the electric potentials of the brain compartments that lead to regularization of the neurotransmitter mechanism, which is proved very potent to control inattention, hyperactivity, impulsivity and distractibility.

In a nut shell it is concluded that *Medhya* drugs along with *Panchakarma* procedures provide an ideal solution to ADHD affected children, which are absolutely side effect free that is the major lacuna of modern medicine and calm down parent's anxiety.

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Supportive Ayurveda Management For Attention Deficit Hyperactivity Disorder In Children

Abstract:

Attention deficit hyperactivity disorder (ADHD) is a behavioural disorder characterized by a persistent pattern of inattention, hyperactivity, forgetfulness, impulsivity and distractibility. Among Indian population, the prevalence of this disorder is 5-10%. Its aetiology is still obscure in modern science while on the basis of *Ayurvedic* etiopathogenesis, it may occur due to vitiation of *Dhee*, *Dhriti* and *Smriti*. These three factors causes imbalance of *kala* and *karma*, which results into improper contact of the senses with their objectives i.e *Asatmendriyarthasamyoga* and give rise to inattention, hyperactivity and impulsivity. Drug therapy for ADHD in modern medicine improves some academic skills but their side effects such as loss of appetite, weight loss, tics, mites, delirium, social withdrawal and obsessive compulsive disorder limits their use. Prolonged use of these medicines may develop abuses and addiction. **Need of study:** To find out supportive *Ayurvedic* modalities employed in the treatment of ADHD and to evaluate a safe and efficacious therapy that is free from side effects. **Conclusion:** *Medhya* drugs which are having *Vatashamak* property and posses nootropic, cognitive, neuroprotective properties are the main stay of treatment of ADHD. Supportive *Panchakarma* therapy (*Shirodhara* and *Shiropicchu*) can be done that calm down aggravated symptoms of ADHD, as the aetio-pathogenesis of this disorder indicates the involvement of *Mastishka* (brain) and *Vatadosha*

Keywords: ADHD, *Medhya* drugs, *Shirodhara*, *Shiropicchu*

Introduction

Attention deficit hyperactive disorder is a neurobehavioral disorder of childhood and characterized by inattention, impulsiveness and hyperactivity. Behavioural and emotional disorders are now the leading cause of disability in children and adolescents ^[1], among them Attention deficit hyperactive disorder (ADHD) is the most frequently encountered and most extensively studied neurobehavioral disorder of childhood. In Indian population 5-10% of people suffered by this disorder with male predominance ^[2]. Various recent studies have shown that ADHD is associated with significant impairment in multiple domains of child's functioning including a high frequency of psychiatric co-morbidity with disruptive mood and anxiety disorder; poor education achievement and low occupational performance, mal-adaptive interpersonal interaction and low self esteem. ^[3]

Ayurvedic Perspective

In Ayurveda, ADHD has not been described as a separate entity. However, there are some references to abnormal behavior that can be correlated with ADHD, such as *Anavasthitachitta*, *Manovibhrama*, *Buddhivibhrama*, *Smritivibhrama*, etc discussed under the features of *Vataprakriti*.^[4] Its aetiology is still obscure in modern science while on the basis of *Ayurvedic* etiopathogenesis we can say it may occur due to vitiation of *Dhee* (rational thinking), *Dhriti* (intellect/retaining power of the mind) and *Smriti* (memory). This vitiation causes imbalance of *kala* and *karma*, which results into improper contact of the senses with their objectives i.e. *Asatmendriyarthasamyoga* and give rise to inattention, hyperactivity and impulsivity.^[4]

Aims and Objective

3. To find out supportive Ayurvedic modalities employed in the treatment of ADHD
4. To evaluate a safe and efficacious therapy that is free from side effects.

Material and Methods

The material for this review paper was collected from the *Ayurvedic* classics and articles searched through open med, Pubmed, Medlar.

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1. Yashtimadhu (*Glycyrrhizaglabra* Linn.)

It is mentioned in *Charak* as *Medhya Rasayan*. *Yashtimadhu* has *MadhurRasa*, *SheetaVirya*, *MadhurVipaka*, *Guru*, *Snigdha* in *Guna* and it is *Vata Pitta Shamak*.^[5] *Madhur*, *Sheeta*, *Vata-pitta Shamak*, and *Rasayana* effects of *Yashtimadhu* bring about soothing effect, probably this helps in bringing about *Sthairya* and *Dhriti* to establish stability of mind as well as in enhancing memory. Active ingredients are glycyrrhizin, flavones, isoflavones, glycyrrhetic acid and six phenolic compounds.^[6] Experiments showed that *G. Glabra* increases the blood circulation to CNS and balance sugar levels in the blood.^[7] The isoflavones, glabridin and hispalglabridins A and B of *G. glabra* possess significant antioxidant activity that protects susceptible brain cells from the oxidative stress. This results in improvement of neuronal function, thereby enhancing the memory.^[8] In an experimental study, it has been found to improve learning and memory due to facilitation of cholinergic transmission in mouse brain.^[9]

2. Mandukparni (*Centellaasiatica* Linn.)

Mandukaparni is *Medhya* by *Prabhava* having *Tikta Rasa*, *SheetaVirya*, *MadhurVipaka*, *laghu* in *Guna* and *Vata Pitta Shamak* property. It improves learning and memory processes by modulating dopamine, 5-Hydroxytryptamine receptor, and nonadrenaline system.^[10] It is effective in preventing the cognitive deficits as well as in oxidative stress.^[11] It reduces stress by reduction in raised circulating corticosterone level. It has neuronal dendritic growth-stimulating property; this may help in enhancing concentration power. 'Asiaticoside', an active principle present in *Ce.asiatica*, imparts anxiolytic activity, thus helps in reducing the anxiety.

3. Guduchi(*Tinospora cordifolia*)

Guduchi, another component of *Medhya Rasayana*, has *Katu*, *Tikta* and *Madhura Rasa*, *Tikshna*, *Laghu*, *Ruksha*, *Sara*, *Guru* and *Snigdha Guna*, *Ushna Virya* and *Tridoshahara* property.^[12,13] Due to *Tridoshahara* property it helps to establish a balance and a good coordination of grasping, retention, and recall of memory. Further, *Rasayana Prabhava* helps in enhancing retaining power. The root extract of *Tinospora cordifolia* was found to possess

normalizing activity against stress-induced changes in nor epinephrine, dopamine, 5-hydroxytryptamine, and 5-hydroxyindoleacetic acid level, thus enhances cognition (learning and memory). Cyclosporine-induced memory deficit was successfully overcome with *Tinospora cordifolia*.^[14] *Tinospora cordifolia*, enhances verbal learning, memory^[15] and have antioxidant activity,^[16] this helps in health promotion as well as preventing forthcoming diseases.

4. Sankhapushpi(*Convolvulus pleuricaulis*)

Shankhapushpi is the most effective among four *Medhya* drugs mentioned by *Acharya Charaka*. It has *Katu* and *Kashya Rasa* and *Guru, Sara, Snigdha, Picchil* in *Guna, Ushna Veerya, Madhur Vipaka* and *Tridoshara* property. *Katu* and *Kashya Rasa* may enhance the alertness, quick understanding and retention of experiences. Phytonutrients help in brain stimulation and increase the ability to concentrate.^[17] *Convolvulus pluricaulis* reduces anxiety and stress by controlling the production of body's stress hormones. Adrenaline and cortisol have anxiolytic, memory-enhancing, mood-elevating,^[18] as well as Neuroprotective effects.

Mode of Action of Medhya Drugs

On the basis of the pharmacodynamics properties it has been observed that most of *Medhya* drugs have mainly *Tikta, Katu, Kashaya and Rasa, Laghu, Guru* and *Snigdha Guna, Madhur Vipaka, Ushna and Sheeta Virya* and *Tridosha shamak* property.

Rasa: Analysis of *Rasa* present in *Medhya* drug reveals that the maximum numbers of drugs have *Tikta, Katu* and *Kashaya Rasa*. *Tikta* being predominant in *Akasha Mahabhut* and *Laghu Guna* increases the *Satva* part of *Mana*. *Kashaya Rasa* predominant in *Vayu Mahabhuta* and *Laghu Guna* increases *Satvik* property of *Mana*^[19] and decreases talkativeness by its *Vachana Nigrahanati* property. *Madhur Rasa* being predominant in *Parthiva Mahabhut* (*Sthairkara karma*)^[19] with *Guru* and *Snigdha Guna* increases *Medhya* effect and *Indriyaprasadana*.

Guna: *Laghu Guna* by virtue having same property increases *Sattva* part of *Mana* that enhances individual *Uttsaha* and *Sphurti*. By the *Prerna* property of *Sara Guna Prerana Karma* of *Vata* becomes normalized and attention span is improved. *Snigdha Guna* nourishes the brain.

Vipaka and Virya: *Madhur Vipaka* of *Medhya* drugs act as *Sarvadhatuvardhaka*, alleviate the vitiated *Pitta* and *Vata Dosh*. *Ushna Virya* also improves blood circulation to brain, as *ADHD* affected children have improper perfusion as well as glucose metabolism in the brain.

Doshagnata: In *ADHD*, vitiation occurs in *Vata Dosh* that simultaneously vitiates *Pitta* and ameliorates *Kapha*. *Kapha Vata Shamak* effect of drugs helps in breaking *Strotorodha* leads to proper functioning of system. *Kapha Shamak* property has properties opposite to that of *Tama Dosh*, helps in dispelling the *Avaran* and normalizing *Tama Dosh*. *Tridoshashamak* effect of drugs brings homeostasis in *Tridosha* and *Triguna* as *Vata* and *Mana* interrelated with each other because *Vata* is responsible for vitiation of *Sharirika* as well *Manasika Dosh* that manifest disease. Thus, these drugs regularize the functioning of *Mana, Sharira, Manasika Dosh, Dhi, Dhriti*, and *Smriti* that are primitive seat of pathology in the treatment of *ADHD*.

Effect of Panchakarma

1. Shirodhara

Pouring of any liquid / medicated liquid (milk, oil etc) over the forehead by specific technique is known as *Shirodhara*. When a constant stream of any liquid is poured over the forehead from a fixed height it results in pressure on the skin over the forehead. This pressure stimulates the pacinian receptors or the mechanoreceptors present on the skin, which in turn lead to mechanical deformation of the receptors. This results in change in the membrane potential of the receptor generated, that leads to generation of action potential which is then passed to the cerebral cortex via brain stem. By this way, sensory information reaches finally to the cerebral cortex. The pressure input from the skin

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2. *Shiropicchu*

In *Shiropicchu* diffusion of the active ingredients of medicated oil occurs through the skin of the site of anterior fontanel and gets circulated all over the brain through the superior saggital sinus and consequent C.S.F pathway. This brings changes in the electric potentials of the brain compartments that lead to regularization of the neurotransmitter mechanism.

Discussion

Review of various clinical and experimental studies along with *Ayurveda* classics show that *Medhya* drug are having cognitive, memory enhancing, nootropic, learning aid, antioxidant, anxiolytic, neuro-protective properties in single as well as in compound form that brings homeostasis in vitiated *Tridosha* & calm down ADHD symptoms. *Yashtimadhu* by its *Rasa* and *Guna* helps in bringing about *Sthairya* and *Dhriti* to establish stability of mind. It increases the blood circulation to CNS, reduces oxidative stress, resulting in improved neuronal function and also has anxiolytic activity. *Madukparni* by its *Medhya Prabhava*, effective in preventing the cognitive deficits as well as oxidative stress, enhances concentration power, and anxiolytic. *Guduchi* due to its *Tridoshara* property helps in balancing of *Doshas*, improves good coordination of grasping, retention and recall of memory, i.e correct *Asatmendriarthasamyoga*, anxiolytic, normalizing activity against stress-induced changes in norepinephrine, dopamine, and enhances cognition (learning and memory). *Shankhapushpi* reduces anxiety and stress by controlling the production of body's stress hormones like adrenaline and cortisol having anxiolytic, memory-enhancing and *Tridoshara* effect. *Shirodhara* and *Shiropicchu* may simply be a specific way of changing the excitabilities in dysfunctional circuits of the brain so that to make the individual to perform normally.

Conclusion

All above discussed *Medhya* drug (*Mandukparni*, *Yashtimadhu*, *Guduchi*, *Sankhapushpi*) used for stress reduction and improve cognition function due to these antioxidant, anxiolytic activities. *Panchakarma* (*Shirodhara* and *Shiropicchu*) brings changes in the electric potentials of the brain compartments that lead to regularization of the neurotransmitter mechanism, which is proved very potent to control inattention, hyperactivity, impulsivity and distractibility.

In a nut shell it is concluded that *Medhya* drugs along with *Panchakarma* procedures provide an ideal solution to ADHD affected children, which are absolutely side effect free that is the major lacuna of modern medicine and serve an important role in calm down parent's anxiety.

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