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CHILDHOOD MENTAL DISORDER AND COMPLEMENTARY MEDICINE: A REVIEW STUDY

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ABSTRACT

Childhood mental disorders are a major public health problem and are associated with considerable burden of disease, suicides, physical comorbidities, high economic costs, and poor quality of life. It has been estimated that approximately one third of the children attending a paediatric clinic suffers not from physical but primarily from psychological illness. Incise of the rest, the illness may have a significant emotional content and psychological aspect, which will have to be handled.[1] The most commonly occurring mental disorders of children as mentioned in DSM-IV, which includes-Anxiety disorders, Attention Deficit Hyperactive disorders, Autism, Learning and Communication disorders, Mood disorders, Mental Retardation, Tic disorders etc. Its etiology is still obscure in modern science while based on *Ayurvedic* etiopathogenetic, 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.* The current medications used in the treatment of mental disorders in children include-Antipsychotic, Antidepressants, Antianxiety drugs, Stimulants and Mood stabilizing groups. Although these drugs are the first-choice medication, but these agents produce various unacceptable side effects, which is one of their greatest demerits. **Need of study:** To find out supportive *Ayurvedic* treatment modalities which can be employed in the management of mental disorders in children and to evaluate a safe, efficacious treatment. **Conclusion**: *Medhya* drugs which are having *Vatashamak* property and possess nootropic, cognitive, neuroprotective properties are the main stay of treatment of mental disorders. Supportive *Panchakarma* therapy (*Shirodhara and Shiropicchu*) can be done that calm down aggravated symptoms.

KEYWORDS: Mental disorders**,** Dhee, Dhriti Smriti, Medhya Drugs, Shirodhara, Shiropicchu.

INTRODUCTION

Mental health, as defined by the Surgeon General's Report on Mental Health, "refers to the successful performance of mental function, resulting in productive activities, fulfilling relationships with other people, and the ability to adapt to change and cope with adversity". Mental health in children is defined by the achievement of expected developmental cognitive, social and emotional milestones and at the same time satisfying social relationships and effective coping skills. According to world health organization, mental disorder to increase by 50% in 2020, to become on the international level one of the main cause of morbidity in children.[2] According to National Alliance for the Mentally Ill (NAHI), approximately 9% to 13% of children under the age of 18 experience serious emotional disturbance with substantial functional impairment, 5% to 9% have serious emotional disturbance with extreme functional impairment due to mental illness. The lack of attention to the mental health of children and adolescents may lead to mental disorder with lifelong consequences, undermines compliance with health regimens and reduce the capacity of societies to be safe and productive.[3] *Ayurveda* the eternal science of life which deals with every aspect of human life, has a different approach towards this. Though in *Ayurvedic* literature it is not mentioned in separate chapters, but some scattered references focus on the etiology, pathology and treatment. The intellectual functions are attributed to *Buddhi* which is defined as the phenomenon by which knowledge is perceived and is solely responsible for fine conclusion after proper reasoning and logic. The three components of *Buddhi* i.e. *Dhi*, *Dhriti* and *Smriti* are responsible for separate functions. Its aetiology is still obscure in modern science while based on *Ayurvedic* etiopathogenetic, it may occur due to vitiation of *Dhee*, *Dhriti* and *Smriti*.

MODERN PERSPECTIVE

On a broad platform the mental disorders are of various types with a brief review given as below:

MENTAL RETARDATION (MR)

While concentrating on the psychiatric morbidity in society, mental retardation was found to be the most common psychiatric disorder. Mental retardation, as it is labeled by modern

medical science refers to IQ level below 70 with deficit in adaptive behavior manifested before 18 years of age.

ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

Attention Deficit Hyperactivity Disorder (ADHD) is among one of the behavioral disorders of children that characterized by a persistent pattern of inattention, hyperactivity, poor impulse control or impulsivity, and distractibility. Symptoms of ADHD are one of the leading causes of academic underachievement in children, which is the major concern for the parents to visit a pediatrician.

ANXIETY DISORDERS

In children and adolescents, the most frequent conditions are separation anxiety disorder (SAD) with a prevalence around 4% and generalized anxiety disorder with prevalence around 4.6% (Hans-Ulrich Witched, 2002). GAD is more common in adolescents and older children than in young children. Anxiety be a cause and effect of poor school performance. Students can be overwhelmed which causes anxiety, and then in turn their poor performance can produce more anxiety.

COGNITIVE DEFICIT

Cognitive deficit also called intellectual disability is a condition beginning in childhood in which children show significant limitation in their ability to learn and function. About 5% of the children have cognitive deficits and most of these children fall into mild range deficit category**.**

AUTISM

Autism is a complex neurobehavioral condition that includes impairments in social interaction and developmental language and communication skill combined with rigid, repetitive behaviors.

The most commonly used pharmacological agents in the conventional system of medicine are the CNS stimulations and certain tricyclic antidepressants. Although these agents are the first-choice medication, but these agents produce various unacceptable side effects, which is one of their greatest demerits. Above all, these drugs have optional for abuse and addiction. Another disadvantage noted with short acting stimulant is the “rebound effect” i.e. worsening of behavior above baseline behavior following the weaning of medication.

AYURVEDIC PERSPECTIVE

Ayurveda the eternal science of life which deals with every aspect of human life, has a different approach towards the mental disorder. The intellectual functions are attributed to Buddhi which is defined as the phenomenon by which knowledge is perceived and is solely responsible for conclusion after proper reasoning and logic. The three components of *buddhi* i.e. *dhi*, *dhriti* and *smriti* are responsible for separate functions. *Dhi* is the natural intellect or wisdom which is innate and leads to perception of true knowledge. On the other hand, *Dhriti* is the type of Buddhi which act as controlling factor and retains the knowledge once acquired. Smriti the third component represents memory or ability to recall things in past. Thus, we can summarize as *Dhi* is the intellect, *Dhriti*, the retention power and *Smriti* power to recall or memory.

In the perception of knowledge along with Buddhi, Mana plays a major role. The successive interaction of Indriyarth with Indriya Mana, Atma, Ahamkara and leads to definite knowledge finally.

Buddhi can be interpreted as Intelligence of modern psychology which is the capacity of an individual to think, act purposefully and deal effectively with the environment. Various factors like heredity, environment, physical and nutritional factors, family size, culture influences the intelligence greatly.

Psychopathology in Ayurveda

Scriptures of *Ayurveda* has mentioned the 'abnormal status of mind', i.e. Psychopathology in various contexts. *Acharya Charak* states that *Raja* and *Tama* are Chief pathogenic factors of the mind and due to them many *Mana Vikaras* are produced.[4] Manas Vikaras are produced due to various Types of Iccha i.e. desire and Dvesa i.e. hate. Hence, the Raja and Tama are the causative factors of mental disorders, which produce various Types of desire and hate and in the end of the process all the mental disorders are generated. The main Dosas of the Mana are Raja and Tama, Hence the Nidnana, which vitiate Raja and Tama may be considered as etiological factors of Manas Vikar. Acharya Charaka mentions that Dhivibramsa (impairment of intellect), Drtivibramsa (impairment of will) and Smrtivibramsa (impairment of memory) are the main causative factors of the mental disorders, which lead to evil Karmas, this stage is defined as a Prajnaparadha.[5] At the biological level Vayu is the Niyanta i.e. controller and *Praneta* i.e. motivator of the mind. So that any dysfunction of *Vata* will afflict mental

activities. Vitiated Vata is responsible for dysfunction of Indriyas and Mana. So, vitiation of Dhee, Dhriti and Smriti are main etiopathogenetic of Manas Vikar in Ayurveda.

AIMS AND OBJECTIVE

1. To find out supportive Ayurvedic treatment regimens to employ in the treatment of mental disorders.
2. 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.

Ayurveda the age-old science of Indian origin describes many treatment modalities for the *Manasa Vikaras*. The science mentions a classification of drugs known as *Medhya* drugs which are having *Vatashamak* property and possess nootropic, cognitive, neuroprotective properties and are a boon to patient of mental disorders. Additionally, *Ayurveda* also mentions some *Panchkarma* therapies like *Shiropichu* and *Shirodhara* which are supportive in nature and gives patient symptomatic relief without any adverse effects. In short, a *Ayurvedic Chikitsa* or management is a blessing for a patient of Mental disorder.

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 (Centellaasiaticalinn), Yashtimadhu Glycirrizaglabralinn), Guduchi (Tinosporacordifolinn), Shankhapushpi (Convolvulus Pleuricaulis).

1. Yashtimadhu (*Glycirrhiza glabra* Linn.)

It is mentioned in Charak Sanhita as Medhya Rasayan. Yashtimadhu has Madhur Rasa, Sheeta Virya, Madhur Vipaka, Guru, Snigdha in Guna and it is Vata Pitta Shamak.[6] 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, glycyrrhetenic acid and six phenolic compounds.[7] Experiments showed that *Glycirrhiza glabra* increases the blood circulation to CNS and balance sugar levels in the blood.[8] The isoflavones, glabridin and hispalglabridins A and B of *Glycirrhiza 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.[9] In an experimental study, it has been found to improve learning and memory due to facilitation of cholinergic transmission in mouse brain.[10]

2. Mandukparni (Centella asiatica Linn.)

Mandukaparni is Medhya by Prabhava having Tikta Rasa, Sheeta Virya, Madhur Vipaka, laghu Guna and Vata Pitta Shamak property. It improves learning and memory processes by modulating dopamine, 5-Hydroxytryptamine receptor, and nonadrenaline system.[11] It is effective in preventing the cognitive deficits as well as in oxidative stress.[12] 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 Centell 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.[13,14] Due to Tridoshhara 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 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.[15] Tinospora cordifolia, enhances verbal learning, memory[16] and have antioxidant activity,[17] 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.[18] *Convolvulus pluricaulis* reduces anxiety

and stress by controlling the production of body's stress hormones. Adrenaline and cortisol have anxiolytic, memory-enhancing, mood-elevating,[19] as well as Neuroprotective effects.

Mode of Action of Medhya Drugs

On the bases 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 *Tridosh shamak* property.

Rasa

Analysis of Rasa present in *Medhya* drug revels 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*[20] and decreases talkativeness by its *Vachana Nigrahanati* property. *Madhur Rasa* being predominant in *Parthiva Mahabhut (Sthairkara karma*) 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 Dosha.Ushna Virya* also improves blood circulation to brain, as well as glucose metabolism in the brain.

Doshaghnata

In *Manas Vikars*, vitiation occurs in Vata Dosha 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 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* that manifest 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 mental disorders.

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 result 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 over the head region is conveyed by the ophthalmic branch of trigeminal nerve to the reticulospinal neurons via a synaptic 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 patients.

In *Ayurveda*, the site which the *Dhara* 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* controls the activity of *Buddhi, Manas* and *Indryas*.[21] Two *Chakrass* viz.-the *Agya Chakra* (situated between two eye brows) and the *Bhramaraguha Chakra* (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 occurs through the skin of the site of anterior fontanel and gets circulated all over the brain through the superior sagittal 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 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 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 *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 like adrenaline and cortisol having anxiolytic, memory-enhancing and *Tridoshhara* 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 mental disorders affected children, which are 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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