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Effectiveness of Yoga and Ayurvedic Techniques for Treating Alzheimer's disease

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Abstract

Alzheimer's disease (AD) is a progressive neurological illness that affects approximately 30 million individuals worldwide. There is currently no effective therapy for Alzheimer's disease. The present research situation in the realm of acceptable therapeutic techniques for the treatment of Alzheimer's disease should be a shift towards the combinatorial approach of Ayurveda and Yoga. This review focuses on adapting Ayurvedic and Yoga techniques for Alzheimer's disease therapy.

Keywords: *Therapeutic approaches, Alzheimer's disease; Yoga; Ayurveda; Neurodegenerative disease.*

INTRODUCTION

Alzheimer's disease (AD) is a neurological illness that is irreversible and progressing. Dementia is the major cause of Alzheimer's disease, affecting about 30 million individuals globally. According to the World Alzheimer Report 2018, a new instance of dementia is diagnosed every three seconds worldwide. Once symptoms appear, there are no effective treatments to cure, reverse, or delay disease development. AD is a complex illness in which both hereditary and environmental factors are involved, and inflammation progression is a prominent cause of AD pathogenesis. The most prevalent abnormalities in the brain tissues of Alzheimer's disease patients are neurofibrillary tangles, neuritic plaques, and senile plaques.

Alzheimer's disease impairs the three major mechanisms that keep neurons healthy: communication, metabolism, and repair. Memory loss, behavioural changes, and trouble with normal workouts are all caused by nerve cell degeneration. Many researchers have used multi-target strategies for the treatment of AD, such as -amyloid peptide aggregation inhibitors, and -secretase inhibitors & modulators, anti-amyloid immunotherapy, tau hyperphosphorylation inhibitors (e.g. JNK3, CDK5, GSK3β & Fyn kinase), tau aggregation inhibitors, microtubule stabilisation, anti-tau immunotherapy, AChE inhibitors, In this article, we attempted to gather adequate evidence demonstrating that Ayurveda and Yoga have considerably helped in numerous unique therapeutic modalities for Alzheimer's disease treatment, despite the usage of the aforementioned pharmacological therapies. We first examined numerous ayurvedic pharmaceutical therapy procedures that are useful in preventing AD progression, and then we covered many yoga practises that are important for AD treatment.

AYURVEDIC THERAPEUTIC APPROACHES IN AD

Rasayana is vital in Ayurvedic formulations for the treatment of mental and cognitive problems, including Alzheimer's disease. The Rasayana is primarily intended to increase oxygenation, which aids in the promotion of neurogenesis through the re-establishment of homeostatic control. It can be seen in Figure 1 that the Ayurvedic medicinal therapy techniques have the same mechanisms as contemporary medicine in a mechanistic investigation and are beneficial in preventing the progression of AD to some extent. They are bioavailable and, as a result, less harmful.

Ayurvedic medications not only alter the neuro-endocrine-immune system, but also provide a rich supply of antioxidants, increase cognitive ability and memory, and boost intelligence. Ayurvedic nootropic herbs and formulations are rich in anti-oxidant, anti-amyloidogenic, anti-inflammatory, neuroprotective, and immunomodulatory substances. Researchers discovered that these characteristics are required to modify neuro-immune activities, increase memory and cognition, renew brain processes, alleviate neurodegenerative cascades of AD, and improve quality of life. Some phytodrugs have recently been thoroughly investigated in in-vivo and in-vitro Alzheimer's disease models, as well as

clinical trials. Extracts of Ginkgo biloba, Curcuma longa, Withania somnifera, and Angelica sinensis have been reported to modulate APP metabolism towards the - secretase pathway, as well as to inhibit the creation, elongation, and stability of A fibrils.

These research may have offered a crucial lead towards the discovery of an acceptable treatment for Alzheimer's disease. Ginkgo biloba has been studied in the prevention of Alzheimer's disease. According to one study, three plants, Buchanania axillaris Desr. (Anacardiaceae), Hemidesmus indicus Linn. (Apocynaceae), and Rhus mysorensis Heyne (Anacardiaceae), have been discovered as multifunctional medicines for the treatment of Alzheimer's disease. It has been discovered that Bramhi Ghrita has properties such as improving cognition, anti-inflammatory properties, small channel clearance, rejuvenator, and blood purification, which are ideal for clearing up toxic metabolic byproducts in the brain and also work to stop neuro degeneration and support neuro protection.

Several studies have shown that ayurvedic medicines, such as Gingko biloba for slowing the progression of AD, Galanthus caucasicus for treating memory impairments, Huperzia serrata for improving memory and mental functioning in AD patients, Catharanthus roseus for treating memory loss and mental impairments, Melissa officinalis for improving cognitive function and reducing agitation, play an important role in treating AD. Curcuma longa (curcumin) enhances amyloid-beta phagocytosis, efficiently cleaning them from the brains of Alzheimer's disease patients, and Withania somnifera (Ashwagandha) for reversing and eradicating the neuritic atrophy and synaptic loss that is the primary cause of neurodegeneration.

In recent years, some studies have reported that biomolecules extracted from plants, such as kaempferol, a flavonoid, have been found to reduce the neurotoxic motor and cognitive impairments in AD flies and oleanolic acid, a pentacyclic triterpene, has been found to enhance A induced memory loss and to restore synaptic plasticity in AD rats [16]. Several isolated compounds (alkaloids) derived from the plants Esenbeckia leiocarpa (Rutaceae), Coptidis rhizoma, and Corydalis cava (Fumariaceae) have been found to exhibit acetylcholinesterase and butyrylcholinesterase inhibitory activities.

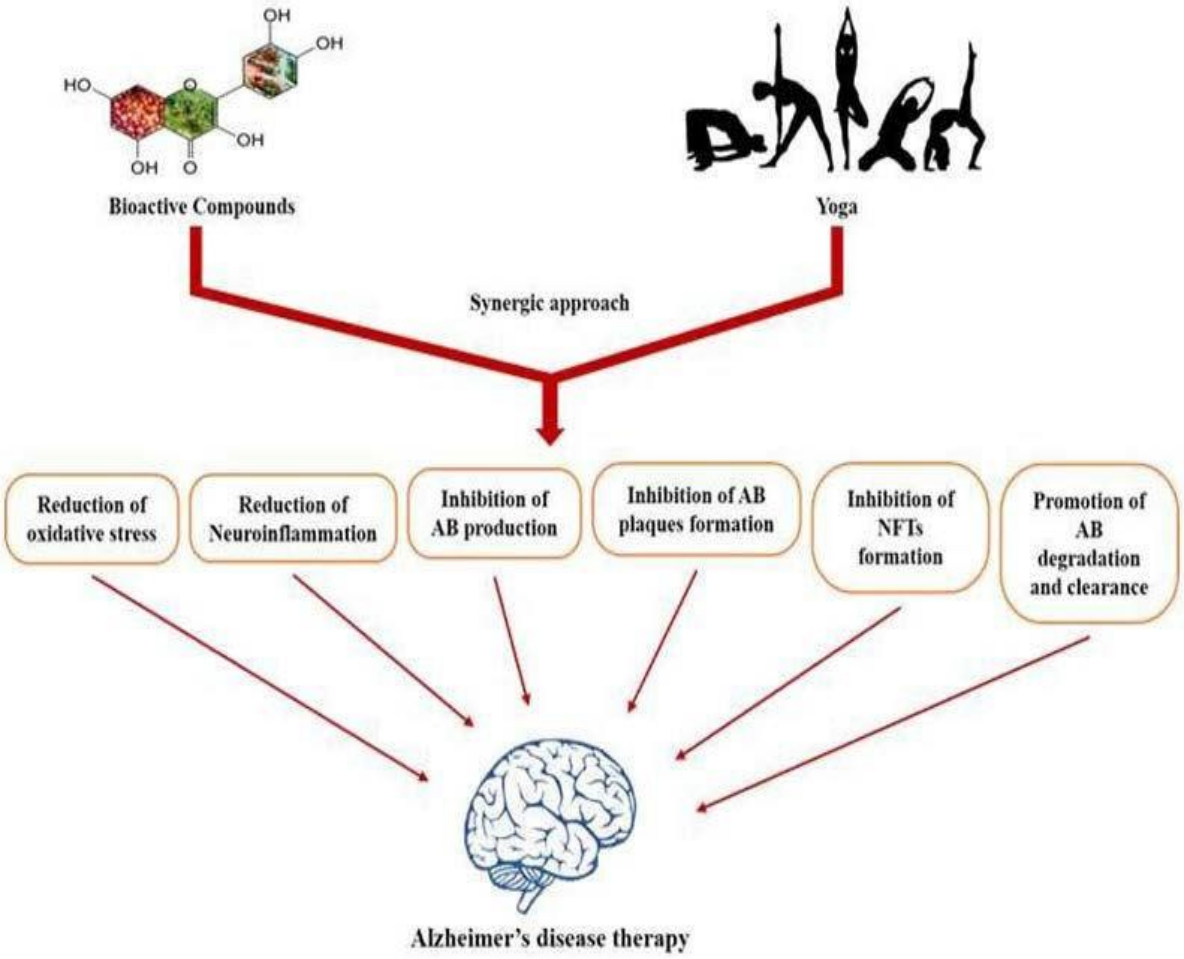

Figure 1 Synergistic neuroprotective effect of Ayurvedic herbs and Yoga practices on AD progression through various aspects.

ANTI-OXIDANT PROPERTY

Antioxidants found in ayurvedic herbs scavenge free radicals, which play an important part in the course of Alzheimer's disease. Many ayurvedic herbs, such as Terminalia chebula, Passiflora incarnata, Typhonium trilobatum, Satureja cuneifolia, Anisomeles indica, Curcuma longa, Bacopa monnieri, Crocus sativus L., contain a wide range of bioactive compounds with strong anti-oxidant and neuroprotective Caesalpinia crista, Camellia sinensis, Scoparia dulcis, Macrosphyra longistyla, Cinnamomum zeylanicum, Melissa officinalis, Caesalpinia crista, Camellia sinensis, Scoparia dulcis. These medicinal herbs have the potential to be a powerful alternative medicine for the treatment of Alzheimer's disease.

ANTI-AMYLOIDOGENIC PROPERTY

Natural extracts (e.g., polyphenols, alkaloids, cannabinoids) of medicinal plants have shown anti-amyloidogenic activity, which is critical for powerful medication development to treat Alzheimer's disease without adverse effects. These therapeutic plants include Grewia tiliaefolia, Cassia tora, Elettaria cardamomum, Caesalpinia crista, Perilla frutescens, Guettarda speciose, Dryopteris crassirhizoma, Dracoephalum moldavica L., Bacopa monnieri (L.) Wetts.

ANTI-INFLAMMATORY PROPERTY

Various medicinal plant extracts (polyphenols, alkaloids, cannabinoids) have demonstrated anti-inflammatory activity in in-vitro/vivo studies, which is critical for developing a viable medicine to treat Alzheimer's disease with no side effects. Terminalia chebula, Crocus sativus L. Lagerstroemia indica, Limonium spathulatum, Okinawa propolis, Corydalis dubia, and Pancratium parvum are therapeutic plants that reduce inflammation in brain regions.

NEUROPROTECTIVE PROPERTY

Plant secondary metabolites including as alkaloids, flavonoids, and phenolic acids have been shown to improve regeneration and decrease neurodegeneration. Many plant compounds with neuroprotective properties are widely used in clinical trials for the treatment of Alzheimer's disease, including nerve growth factor, valproate and other GSK inhibitors, various nicotinic agonists, the CEP-1347 stress kinase inhibitor, minocycline as a caspase inhibitor, and metal chelators. Bacopa monnieri (L.) Wettst, Grewia tiliaefolia, Vernonia amygdalina, Levisticum officinale, Schisandra chinensis, Withania somnifera, Ginkgo biloba, and Kigelia africana have neuroprotective properties by improving neuron cell regeneration and inhibiting neurodegeneration.

YOGA PRACTICES ARE VITAL IN AD

Yoga is an ancient Indian non-religious mind-body technique that blends spiritual, mental, and physical components to enhance health and well-being. Yoga provides several fundamental advantages and has a good influence on various bodily systems such as the musculoskeletal system, cardiovascular system, neurological system, and endocrine system. Meditation has significant potential for stress reduction, which is useful for minimising cognitive and memory loss. Stress is dependent on the amount of cortisol in the body, which is

responsible for the evolution of Alzheimer's disease and can be managed by regular meditation practise; however, very few research have been undertaken with Alzheimer's patients. Some neurotransmitters produced during Yoga indicate a potential biological basis for improvement in Alzheimer's disease neuropathology. Long-term aerobic exercise has been shown to improve cognitive performance and reduce hippocampus atrophy, which aids in the prevention of Alzheimer's disease, and it may also be an essential aspect of the therapy for Alzheimer's disease. Aerobic exercise has been shown to have significant health benefits, including improved executive function, attentional capacity, processing speed, episodic memory, and procedural memory. Several studies have suggested that physical exercise may be able to prevent and restore these behavioural abnormalities in certain models of AD as well as reduce dementia symptoms. According to a recent study, meditation may have an important role in enhancing cognition and associated outcomes in Alzheimer's disease patients.

CONCLUSION

The current research scenario in the field of the search for suitable therapeutic approaches for the treatment of Alzheimer's disease should shift towards the combinatorial approach of Ayurveda and Yoga, because neither of these two has any side effects, and both must be beneficial for any type of human disease. Memory training, mental and social stimulation, and physical exercise programmes are non-drug therapies that may enhance people's cognitive function. We discovered that Ayurvedic medicinal techniques and Yoga practises have been widely employed for health promotion, illness prevention, and probable therapy of Alzheimer's disease after reviewing the existing literature on the subject. Many bio-available Ayurvedic medicines have been employed to change the therapy of Alzheimer's disease. They have numerous unique properties such as being less toxic, anti-oxidant, anti-amyloidogenic, anti-inflammatory, neuroprotective, and immunomodulatory, which are critical in the discovery of acceptable effective medications for Alzheimer's disease and are also important in terms of cost and time. Many studies have demonstrated that yoga is essential for treating neurodegenerative illnesses using a combination of yogic movements. The combination of Ayurveda and Yoga would bring considerable results for a noble method of Alzheimer's disease therapy. In the future, these combinations may be

shown to provide a better cure for Alzheimer's disease.

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