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REVIEW ARTICLE

Integrating *AYUSH* Therapies for the Management of Neurodegenerative Disorders

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Abstract

Neurodegenerative disorders, such as Alzheimer's disease, Parkinson's disease, and multiple sclerosis, are characterised by progressive degeneration of the nervous system, leading to debilitating symptoms and a significant impact on quality of life. Traditional and complementary medicine systems, like *AYUSH* (*Ayurveda*, *Yoga*, *Unani*, *Siddha*, and *Homoeopathy*), have gained attention for their potential in managing these disorders. This review explores the integration of *AYUSH* therapies in the management of neurodegenerative diseases, focusing on their mechanisms of action, efficacy, and clinical applications. *Ayurveda* emphasises the use of herbal formulations, dietary modifications, and detoxification processes to balance doshas (body energies) and rejuvenate the nervous system. *Yoga* and meditation are widely used to enhance cognitive function, reduce stress, and promote neuroplasticity. *Unani* and *Siddha* systems offer natural remedies and therapeutic practices that aim to restore balance in the body and improve overall health. Homoeopathic treatments, with their individualised approach, focus on symptom relief and enhancing the body's innate healing abilities. The growing body of scientific research supports the use of *AYUSH* interventions in neuroprotection, antioxidant activity, anti-inflammatory effects, and neurotrophic support, which are crucial for slowing the progression of neurodegenerative diseases. However, more rigorous clinical trials are necessary to validate these therapeutic approaches and establish standardised protocols for their integration into mainstream healthcare. This paper highlights the potential of combining *AYUSH* therapies with conventional treatments to provide a more holistic and effective strategy for managing neurodegenerative disorders, emphasising personalised care, prevention, and improved quality of life for patients.

Major Findings: *AYUSH* therapies have been shown to have neuroprotective properties, such as antioxidant activity, anti-inflammatory effects, and support for neurotrophic factors, which are important for slowing the progression of disease. To confirm these therapeutic approaches and create standardised guidelines for their inclusion into mainstream healthcare, more thorough clinical trials are required, as the data is still preliminary.

Keywords: *Ayurveda*, *AYUSH* Therapies, Complementary Medicine, Neurodegenerative Disorders, Neuroprotection, *Yoga* and Meditation

1. Introduction

Our brains are incredibly sophisticated organs with countless pathways that enable us to perform our incredible abilities. We rely on the billions of cells that make up our brain day in and day out to function properly. Neural cells are among the brain's most significant cells[1]. The idea of selective susceptibility is encapsulated in the common feature of neurodegenerative diseases: the loss of neurons in certain groups. Anatomically linked functional systems, such as the limbic and higher order association

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cortices or the extrapyramidal and pyramidal motor systems, are affected by neuronal loss in many of these disorders[2]. Selectively susceptible groups of neurons gradually disappear in neurodegenerative illnesses, as opposed to selectively static neuronal loss resulting from toxic or metabolic disorders[3]. Cognitive, motor, and general body functioning might all deteriorate as a result of these illnesses. Amyotrophic Lateral Sclerosis (ALS), Parkinson's disease, and Alzheimer's Disease are a few prevalent neurodegenerative illnesses[4]. Known genetic processes or the main components of protein deposits are used to categorise neurodegenerative diseases[5].

There are several forms of neurodegenerative diseases that may be distinguished by their clinical characteristics. Alzheimer's disease is one of the dementia-type disorders that cause gradual cognitive loss that impairs thinking and memory. The degradation of neurons is the main cause of movement and coordination impairment in Parkinsonism-type disorders, including Parkinson's disease. As motor neurons degrade, motor neuron illnesses such as ALS cause a progressive loss of muscular control. Prion disorders, such as Creutzfeldt-Jakob disease, are brought on by aberrant proteins that cause other proteins to fold improperly, which accelerates the degeneration of neurons. Because each kind has distinct symptoms and difficulties, diagnosis and therapy must be approached with specificity[6,7]. Many patients with dementia and cognitive decline brought on by Alzheimer's disease and its related conditions, such as Parkinson's disease, Lewy body disease, vascular dementia, and frontotemporal degeneration, among others, have depressive symptoms at some point during their illness[8].

The most significant risk factor is age; aging has a differential effect on neuroanatomical pathways; pathogenic proteins are formed when these pathways degenerate; these pathogenic proteins spread along anatomical pathways; familial and sporadic disease phenotypes are similar; and neurodegenerative disease is characterised by heterogeneity, overlapping phenotypes, and multiple pathologies[9]. They are typified by an irreversible loss of a certain kind of neuron[9,10].

The pathophysiology of neurodegenerative diseases, such as Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis, and HIV-associated dementia, is mostly influenced by inflammatory neurotoxins released by microglia, primarily reactive oxygen species[11]. Over the last ten years, we have gained a better knowledge of the molecular genetics and environmental variables that induce or raise the risk of age-related neurodegenerative diseases[12]. Access to glucose is restricted as a result of a continuously declining neuronal metabolism of glucose, which leads to an increasing Adenosine Triphosphate (ATP) generation shortage.

Nicotinamide Adenine Dinucleotide (NAD) deficit in the mitochondrial salvage pathway and consequent impairment of the Krebs cycle trigger this vicious cycle of energy metabolism at the cellular level. Moreover, a declining NAD level impairs the action of NAD-dependent enzymes, which increases genetic mistakes and starts the degeneration and death of neurons[13].

The risk for Parkinson's disease and all-cause dementia has been linked to Traumatic Brain Injury (TBI), especially moderate to severe TBI. The risk for certain dementia subtypes is more varied[14]. Mood disorders, including anxiety and depression, are more common in women, whereas dopamine system deficiencies like Parkinson's Disease (PD), Attention-Deficit Hyperactivity Disorder (ADHD), and autism are more common in men[15].

2. *AYUSH*

Ayurveda, *Yoga* and Naturopathy, *Unani*, *Siddha*, *Sowa-Rigpa*, and *Homoeopathy*, or *AYUSH*, are the alternative medical systems that the Indian government has approved. India, which has a diversified medical culture and a long history of using alternative medicine modalities, including *Ayurveda*, *Yoga* and Naturopathy, *Unani*, *Siddha*, and *Homoeopathy* – now together referred to as *AYUSH* – should pay particular attention to international trends[16]. *Ayurveda* also makes use of contemporary diagnostic methods and instruments. *Ayurveda* and contemporary medicine must, however, overcome some obstacles, including cultural prejudices and a dearth of scientific research[17].

It has been demonstrated that *Yoga* offers several health advantages, such as lowering stress and anxiety, increasing flexibility and physical fitness, and enhancing general well-being. More investigation and scientific proof are necessary, nevertheless, to back up

the incorporation of *Yoga* into contemporary medicine and to create uniform standards for its application in therapeutic settings[18,19]. *Unani* medicine is founded on the ideas of improving health by natural cures and treatments and harmonising the body's inherent components. The integration of *Unani* medicine with contemporary medicine is not without its difficulties, though, such as the dearth of scientific studies and the restricted availability of *Unani* practitioners[20]. Using natural medicines and therapies to promote good health and balance the body's energy is the foundation of *Siddha* medicine[21]. Integrating *homoeopathy* into current medical procedures entails integrating the complementary and alternative medicine system. The foundation of *homoeopathy* is the use of extremely diluted medicines to promote the body's inherent healing mechanism[22,23].

2.1 Mechanism Involved in *AYUSH*

The *AYUSH* system takes a comprehensive and integrated approach to neurodegenerative illnesses. By employing herbal formulations and purification methods to balance doshas (body energies), *Ayurveda* may lessen oxidative stress and inflammation, two major contributors to neurodegeneration. Through physical postures, breathing techniques, and meditation, *Yoga* improves neuroplasticity and lowers stress, which may boost cognitive and motor function. In order to promote neuronal health and metabolic processes, the *Unani* and *Siddha* systems use natural treatments to restore equilibrium in the body's humours and energy. Through customised treatments, *homoeopathy* increases the body's capacity for self-healing by focusing on its vital energy. These systems work in tandem to enhance general neurological health and support traditional therapy.

2.2 A-*Ayurvedic*

Traditional medicine has a long history in India. Indian traditional medicine, or *Ayurveda*, aims to avoid sickness in the first place as well as treat existing conditions[24]. Numerous details on traditional elements of medicinally significant drugs and ethnic folklore practices may be found in *Ayurveda*. This old medicine and formulation principle remains relevant despite changes in the environment, lifestyle, society, and illness patterns. Two fundamental components make up the foundation of Ayurvedic therapy. These are intended to stop the disease's root cause and increase the patient's awareness of it[25].

Personalised treatment is provided by one of the oldest medical systems in the world, *Ayurveda*. This all-encompassing method of therapy, which developed from these roots, uses natural cures, such as massage, detoxification treatments, exercise, lifestyle changes, and medicinal herbs and minerals, to promote health and control illness. According to each patient's distinct constitution and present and future health requirements, *Ayurveda* provides them with personalised preventive and therapeutic approaches[26].

The five components of the cosmos, according to *Ayurveda*, are *Vayu* (air), *Jala* (water), *Aakash* (space or ether), *Prithvi* (earth), and *Teja* (fire)[27]. In various combinations, these five components – known as *Pancha Mahabhoota* in *Ayurveda*—are said to constitute the three fundamental humours of the human body. Collectively referred to as the "*Tridoshas*," the three humours – *Pitta, Kapha*, and *Vata* – control the body's fundamental physiological processes. Each of the three primary doshas has five sub-doshas. *Ayurveda* offers a variety of therapy methods to enhance people's well-being by taking into account their physical makeup, medical history, Dosha traits, lifestyle, and surroundings[28].

2.2.1 Role of Ayurveda in Neurodegenerative Disorder

Multiple sclerosis, Parkinson's disease, and Alzheimer's disease are examples of neurodegenerative diseases that cause progressive neuronal death, memory loss, and sensory impairment. The traditional trifecta of granulovacuolar degeneration, neurofibrillary tangles, and senile plaques is believed to be the etiology of Alzheimer's disease. The diagnostic characteristics also include hostility, anxiety, depressive symptoms, visual problems, memory loss, and trouble comprehending and retaining new information. In order to protect the Central Nervous System (CPS) against neuronal injury, neuroprotection encompasses both acute and progressive neurodegenerative illnesses, such as Parkinson's and Alzheimer's. Together with balanced lifestyles that include healthy eating habits and moderate exercise, herbal medication can help prevent diseases rather than only treat them. The use of plant

organs as a supplemental and alternative medicine is known as herbal treatment, or simply plant therapy. It is thought that ayurvedic formulations like *Madhuyashti* (*Glycyrrhiza glabra*) and *Guduchi (Tinospora cordifolia)* have adaptogenic, mental-boosting, and immunomodulatory qualities that promote healthy aging. A Drosophila model was used to assess the processes behind *Guduchi and Madhuyashti's* ability to provide stress tolerance[29].

Ayurveda uses several new techniques to treat problems of the central nervous system by using herbs or their preparations, or both. To show if these herbs or their constituents, whether taken orally or in another way, penetrate the blood-brain barrier and enter the central nervous system, adequate research is needed. One innovative approach of herbal delivery, known as "*NASYA*," is the intranasal administration of medicinal oils or dry herbal powders. It is a quick, easy, non-invasive, and practical way to introduce therapeutic substances into the central nervous system. There are several advantages to intranasal administration for delivering drugs into the central nervous system, and interest in this non-invasive method of administration has grown. By avoiding the blood-brain barrier and going straight to the central nervous system, the delivery is quick and minimises systemic exposure and adverse effects[30].

2.2.2 Herbal Medications Used in the Treatment of Neurodegenerative Diseases

Due to their higher effectiveness and fewer adverse effects, a number of herbal medicines have been utilised to treat neurological problems since ancient times. These include *saffron* (*Crocus sativus), ginkgo biloba,_Ashwagandha* (*Withania somnifera*), turmeric (*Curcuma longa*), *sankhpushpi* (*Convolvulus pluricaulis*), *brahmi* (*Bacopa monnieri*), *gotu kola* (*Centella asiatica*), *triphala* (*emblica officinalis*), and cat's claw (*Uncaria tomentosa*).

2.2.2.1 Ashwagandha (Withania somnifera)

It is one of the most common herbs used to treat Alzheimer's disease. *Ashwagandha* stimulates the immune system and has antioxidant and free radical scavenging properties. *Ashwagandha* plant extract is used to cure and prevent a number of illnesses, including cancer, diabetes, impotence, arthritis, and neurological diseases. Studies to date have shown that *W. somnifera* root preparations and extracts do not produce any toxicity, even when used for long-term therapy[31,32].

2.2.2.2 Shankhapushpi (Convolvulus pluricaulis)

The oral treatment of CP extract (150 mg/kg) to rats treated with scopolamine decreased elevated tau protein and mRNA levels, along with a decrease in AβPP levels, as compared to the population treated with scopolamine. The extract's neuroprotective qualities were further supported by its microscopic demonstration of its capacity to prevent scopolamine neurotoxicity. The reduction of scopolamine's neurotoxic effects by CP treatment suggests that it has the potential to be a potent neuroprotective agent[33].

2.2.2.3 Haridra (Curcumin)

Curcumin's antioxidant and anti-inflammatory properties aid in the treatment of emerging illnesses. To treat neuroinflammation, curcumin, a TNF blocker in many cell types and tissues, has been chemically optimised to provide an injectable depot for continuous local release. The addition of amyloid sheet conformations, which are a feature of many neurodegenerative diseases, is bound and inhibited by curcumin[34].

2.2.2.4 Mandukaparni (Centella asiatica)

Water and an open field T-maze exams look at memory, learning, and movement. Neuronal cell morphology is stained with apoptosis and cresyl violet. We used immunohistochemistry to examine the glutamate AMPA receptor GluA1 subunit and the GABA receptor GABAA 1 subunit in the hippocampus of the same animals. While 30 mg/kg had no effect on reversal learning, it improved understanding, remembering, and memory consolidation (p 0.05). The cognitive effects of CAW may be explained by the stimulation of dendritic arborization and synaptic differentiation by CAW and many of its components. Beyond Alzheimer's disease, the extract may have therapeutic promise because CAW and its component compounds improved neuronal endpoints. In the therapy of inflammatory diseases, wound healing, and immunomodulatory activity, *E. albinosides* and *C. asiatica* show promise. Both herb extracts improve visual memory and block AChE[34].

2.2.3 Plants and Phytochemicals under Clinical Trials

As the population ages, the prevalence of neurodegenerative diseases, which are crippling and disabling, is rising. Thus, the development of any treatments that halt or decrease the advancement of the disease will contribute to a reduction in the socioeconomic and psychological load. Preclinical research has shown that a number of plant-derived drugs and their extracts that target neuroinflammation, oxidative stress, and mitochondrial dysfunction have a lot of potential. Several plant extracts and the bioactive substances they contain have been shown in several preclinical studies to be effective in treating

Table 1. Market preparation of *Ayurvedic* in neurodegenerative disorder

Sr. No.	Brand Name	Content	Dosage	Uses
1	*Brahmi Max*	*Bacopa Monnieri* Extract	1-2 capsules daily	Enhances memory and cognitive function
2	*Shankhpushpi Pro*	*Convolvulus Pluricaulis*	1-2 teaspoons daily	Improves intellect, focus, and reduces stress
3	*Ashwagandha Plus*	*Withania Somnifera*	1-2 teaspoons daily	Supports brain health, reduces anxiety,
4	*Gotu Kola*	*Centalla Asiatica*	300-600 mg Daily	Enance cognitive function, improve mental clarity
5	*Turmeric*	*Curcuma longa*	400-600 mg thrice daily	Anti-inflammatory, antioxidant
6	*Jatamansi*	*Nardostachys jatamansi*	1-2 grams daily	Calming effects, improves cognitive functions
7	*Vacha*	*Acorus calamus*	125-250 mg twice daily	Improves memory, supports mental clarity
10	*Tulsi*	*Ocimum sanctum*	300-600 mg twice daily	Adaptogen, reduces oxidative stress
11	*Amalaki*	*Emblica officinalis*	500-1,000 mg daily	Antioxidant, supports overall brain health
12	*Saraswatarishta*	Herbal formulation	15-30 ml twice daily	Supports cognitive function, calming effects
13	*Vidarikand*	*Pueraria tuberosa*	5-10 grams daily	Improves cognitive functions, supports brain health
14	*Jyotishmati*	*Celastrus paniculatus*	300-600 mg daily	Enhances memory, reduces cognitive decline
15	*Nirgundi*	*Vitex negundo*	500-1,000 mg twice daily	Anti-inflammatory, neuroprotective
16	*Brahmi Taila*	*Bacopa monnieri oil*	Apply externally as directed	Enhances memory, supports mental clarity
17	*Rasayana Churna*	*Herbal formulation*	3-6 grams daily	General tonic, supports overall brain health
18	*Brahmi Ghrita*	*Bacopa monnieri, Ghee*	1-2 teaspoons daily	Enhances cognitive function, improves memory
19	*Mahakalyanaka Ghrita*	Herbal formulation	1-2 teaspoons daily	Supports brain health, promotes overall well-being
20	*Chyawanprash*	Herbal formulation	1-2 teaspoons daily	Antioxidant, supports overall health and vitality
21	*Vacha Churna*	*Acorus calamus* powder	125-250 mg twice daily	Enhances cognitive function, supports mental clarity
22	*Manasamitra Vatakam*	Herbal formulation	1-2 tablets twice daily	Reduces stress, anxiety, and enhances cognitive functions
23	*Smriti Sagar Rasa*	Herbal formulation	1-2 tablets twice daily	Enhances cognitive abilities, supports mental clarity
24	*Ashwagandharishta*	*Withania somnifera extract*	15-30 ml twice daily	Neuroprotective, reduces stress and anxiety
25	*Kalyanaka Ghrita*	Herbal formulation in ghee	1-2 teaspoons daily	Supports brain health, enhances memory and cognition
26	*Panchagavya Ghrita*	Herbal formulation in ghee	1-2 teaspoons daily	Supports overall brain health, cognitive enhancer

neurodegenerative illnesses, such as AD, PD, TBI, and others. (Table 1) The strong anti-inflammatory, anti-apoptotic, and antioxidant properties of certain plant extracts and bioactive chemicals obtained from plants may aid in neuroprotection[35,36].

2.3 Y-*Yoga*

The National Centre for Supplementary and Integrative Health has recognised *Yoga*, a mind-body practice with ancient Indian roots, as a supplementary health method. The Sanskrit root "yuj," which means "to yoke" or "to unite," is where the term "*Yoga*" originates. This root represents the unity of body, mind, and spirit. Many people practice *Yoga* to prevent sickness and enhance overall well-being. The use of it as an adjuvant treatment for the symptoms of a number of illnesses, such as anxiety, depression, low back pain, asthma, hypertension, musculoskeletal diseases, cancer, chronic obstructive pulmonary disease, and neurological disorders, is also growing. *Yoga* has been shown to lower cardiovascular risk factors, increase sleep quality, and lessen pain, anxiety, and sadness. One of the most popular forms of mind-body medicine is *Yoga*, which is used to prevent illness, promote health, and perhaps treat neurological conditions[37-40].

Yoga has been shown to enhance cardiovascular functionality and is a potential stress-reduction strategy; in other words, it is a great way to reduce some of the modifiable risk factors for AD. Recently, *Yoga* has been found to be a safe activity that improves cognitive abilities in both healthy older persons with Moderate Cognitive Impairment (MCI) and those in the early stages of dementia. *Yoga* has been shown to enhance blood pressure, breathing rate, cardiorespiratory fitness, body flexibility, balance, joint movement, muscular strength, and endurance in longer-term care facilities for older persons with dementia. The attainment of greater wellness, illness prevention, fitness, vitality, physical and mental health, immunological functioning, back pain, arthritis, anxiety, and depression are other reasons for practising *Yoga*, according to reports from the general public[41-43].

2.3.1 How the Practice of Yoga in Neurological Disorders and Its Effect

In order to prevent and reduce the course of several neurological disorders, including Parkinson's Disease (PD), epilepsy, dementia, chronic headaches, stroke, AD, and more, *Yoga* may be recommended as an effective adjuvant therapy. However, it should be remembered that *Yoga* should always be done under the supervision of a qualified instructor and in accordance with the specific illness protocol. Preventive precautions should be considered throughout the practice. For instance, when performing *shirsasana* (headstand), one must pay attention to proper technique, holding time, body alignment, and posture correction. An experienced *Yoga* trainer must make sure that everyone is practising a certain asana and that no one is not[44].

2.3.2 Yoga in Parkinson

With a prevalence of 160/100,000 in Western Europe and a rise to 4% of the population over 80.1%, Parkinson's Disease (PD) is a prevalent neurodegenerative ailment that is a synucleinopathy. As the population ages, managing PD is expected to become a more significant and difficult part of general practitioners' and neurologists' practice. Since PD is still mostly diagnosed clinically, it's critical to identify early characteristics as well as symptoms and indicators that point to alternative sources of the disorder[45].

The impact on quality of life makes non-motor symptoms of PD, such as cognitive, neuropsychiatric, sleep, autonomic, and sensory problems brought on by intrinsic PD pathology or drug-induced side effects, urgently need to be addressed. Patients are increasingly looking for a more holistic approach to treatment, maybe as a result of this. *Yoga*, massage, and acupuncture were found to be used far more often by PD patients to address their health issues after the start of conventional therapy[46].

Yoga, a growingly popular health-related exercise, offers a highly developed, precisely defined method for influencing human behaviour, mainly through the intimate synchronisation of the central and peripheral nerve systems. A 12-week *Yoga* intervention was shown to substantially enhance motor Unified Parkinson's Disease Rating Scale (UPDRS) scores, balance function, flexibility, posture, and locomotion when compared to a control group that did not receive any intervention, according to one pilot study21. One more reported improvement in symptoms, such as a decrease in acute tremor[47].

A secondary analysis by Ni *et al.*,[48] found that patients with PD who received a *Yoga* intervention showed

statistically significant improvements in bradykinesia and rigidity as measured by the UPDRS compared to the control group. The same group used pneumatic resistance machines to measure the strength and power of various muscle groups, and the *Yoga* group showed a significant improvement in strength compared to the control group, but not in power, with the exception of the leg press.

The RCT of found that the patients with PD were more stable and erect after 12 weeks of *Yoga* and had a quick and appropriate response to external stimuli. The study by Myers is the only one that evaluated the effect of *Yoga* on the various components of balance (BESTest) in patients with PD, and it highlights the significant improvement of balance that *Yoga* brings to people with PD.

PD symptoms are significantly impacted by depression, which is often ignored and undertreated. *Yoga* practice has been shown to improve memory, stress, depression, and anxiety in a healthy population, possibly as a result of improved cortisol levels. *Yoga* has been shown to improve depression, anxiety, fatigue, and pain in people with chronic pain, and to have a significant impact on psychological functions and Quality Of Life (QOL), fatigue, and cognition in people with multiple sclerosis. *Yoga* also appears to improve physiological and non-motor factors that can affect QOL in PD participants over a relatively short period of time. It is important to determine conservative interventions to treat physiological functions and clinical outcomes that contribute to QOL in PD, for which *Yoga* is a viable intervention[49].

2.3.3 Yoga in Alzheimer's Disease

The term Alzheimer's Disease (AD) dementia describes a specific onset and progression of age-related cognitive and functional decline that leads to death (Alzheimer's Association, 2019). Alois Alzheimer first described the condition in 1906 when he described the case of Auguste Deter, a 51-year-old woman he first saw in 1901 who had cognitive disturbance, disorientation, delusions, and other behavioural changes. Mrs. Deter passed away 4.5 years later in 1906, and Alzheimer's neuropathologic evaluation revealed diffuse brain atrophy and "particular changes in cortical cell clusters"[50].

It has been demonstrated that *Yoga* and meditation help AD patients slow down their cognitive loss, although the exact molecular processes causing these benefits are still unclear. Hassan *et al.* theorised that the neurotransmitters triggered by *Yoga* practice would counteract the symptoms of AD using an in vitro model. The impact of several neurotransmitters and neurotrophins released during *Yoga* on the cellular model of AD was ascertained by Hassan *et al.* Among these were histamine, dopamine, serotonin, acetylcholine, nerve growth factor, brain-derived neurotrophic factor, and others[51].

Yoga has been shown to have beneficial effects on older adults, particularly those with AD. Hakim *et al.*, observed that *Yoga* and tai chi significantly improved balance in studies of healthy older persons, while Oken *et al.*, found that practising *Yoga* increased flexibility and balance. Furthermore, Oken *et al.*, documented notable alterations in general health-related quality of life, such as physical function, vitality, social interaction, and body discomfort. Research on Silver *Yoga*, a specially created *Yoga* program for fragile old people, showed substantial improvements in depression, daily functioning, and sleep quality.

For individuals with AD, a seated *Yoga* program similar to the modified silver *Yoga*, administered by nurses in a palliative care program, showed positive subjective responses by residents to increased physical and emotional well-being and decreased stress of caregivers. Fan and Chen modified the silver *Yoga* program and found significant changes in not only balance and flexibility, but also strength, endurance, depression, and behaviour. Lastly, Litchke, Hodges, and Reardon (2012), using a multisensory chair *Yoga* program, reported a trend toward improvement in ADLs for persons with mild to severe AD.

Given the prevalence of AD and the new research showing the advantages of multisensory exercise, like *Yoga*, further research is necessary to accurately depict the experiences of AD patients who practice *Yoga*. Therefore, the goal of this qualitative study was to investigate the significance of a ten-week multisensory *Yoga* program for 26 individuals with AD[52].

2.3.4 Yoga in Huntington's Disease

A neurodegenerative condition known as Huntington's Disease (HD) is brought on by an aberrant growth of Huntingtin gene CAG repeats. HD is expressed by those with more than 35 CAG repeats, and the

sooner the expansion, the earlier the illness start, which typically occurs at age 40 Cognitive deficiencies (*e.g.*, attention deficits, dementia), behavioral/psychological abnormalities (*e.g.*, depression, poor self-esteem, anxiety), and mobility dysfunction are characteristics of HD that cause functional deterioration and, eventually, mortality within 15-30 years after diagnosis[53].

Since *Yoga* enhances balance, mobility, and general well-being, it may be helpful for those with Huntington's Disease (HD). *Yoga* must be customised to meet the unique requirements and difficulties of people with HD, though. Activities like as chair *Yoga* and other capabilities-appropriate modified postures can help preserve and enhance mobility. Falling danger is a significant worry for people with HD, and *Yoga* sessions that emphasise balance can help lower that risk. In addition to its physical advantages, *Yoga* helps those with chronic illnesses by promoting relaxation and lowering stress levels. Regular *Yoga* practice also keeps joints and muscles flexible, which promotes everyday mobility and general wellness[54,55].

2.3.5 Yoga in Stroke

Occlusion, ruptured illnesses, and cerebrovascular circulation problems are all referred to as strokes for various reasons. Brain haemorrhage, cerebral infarction, and various physical and cognitive impairments are the primary symptoms. According to statistical statistics, stroke is common in middle-aged and older adults; it also has high rates of death, disability, and recurrence after commencement. There is no way to completely eradicate the influence of a radical stroke on a patient's day-to-day life[56].

After a stroke, *Yoga* can be extremely beneficial to a patient's recuperation and rehabilitation. By promoting neuroplasticity and improving brain-body coordination, this age-old technique strengthens the mind-body link, which is essential for stroke recovery. *Yoga* helps stroke survivors regain strength, balance, and range of motion, which greatly facilitates their physical rehabilitation1. Aside from its physical advantages, it also helps people relax and feel less anxious, all of which are critical for a full recovery.

Yoga's versatility allows it to be customised to stroke patients' requirements, whether it be through chair *Yoga*, meditation, or mild stretches. *Yoga* can improve overall outcomes in stroke rehabilitation programs, including mobility and quality of life, according to studies and medical organisations like the Cleveland Clinic. See the Cleveland Clinic article and the Flint Rehab summary for further details[57,58].

2.3.6 Different Types of Yogasanas for Treatment of Neurodegenerative Disorder

2.3.6.1 Parkinson's Disease

- *Tadasana* (Mountain Pose): Enhances stability and posture.
- *Vrksasana* (Tree Pose): Improves focus and equilibrium.
- *Adho Mukha Svanasana* (Downward Dog Pose): Stretches muscles and builds upper body strength.

2.3.6.2 Alzheimer's Disease

- *Vajrasana* (Thunderbolt Pose): Encourages relaxation and improved digestion.
- *Shavasana* (Corpse Pose): Aids in anxiety reduction and relaxation.
- *Matsyasana* (Fish Pose): The brain and spinal cord are stimulated.

2.3.6.3 Multiple Sclerosis (MS)

- *Bhujangasana* (Cobra Pose): Strengthens the spine and increases flexibility.
- *Setu Bandhasana* (Bridge Pose): Helps release tense muscles and strengthen the core.
- *Anjaneyasana* (Low Lunge Pose): Increases stability and leg strength.

2.3.6.4 Huntington's Disease

- *Balasana* (Child's Pose): Reduces stress and exhaustion.
- *Ardha Matsyendrasana* (Half Spinal Twist): Improves the motion of the spine.
- *Supta Baddha Konasana* (Reclining Bound Angle Pose): Helps to expand the hips and calm the mind.

2.3.6.5 Amyotrophic Lateral Sclerosis (ALS)

- *Sukhasana* (Easy Pose): Encourages relaxation and awareness.
- *Marjaryasana-Bitilasana* (Cat-Cow Pose): Extends and strengthens the neck and back.
- *Viparita Karani* (Legs-Up-The-Wall Pose): Increases blood flow and lessens exhaustion.

2.3.6.6 Epilepsy

- *Padmasana* (Lotus Pose): Promotes serenity and focus.
- *Nadi Shodhana Pranayama* (Alternate Nostril Breathing): Makes the neurological system balanced.
- *Shavasana* (Corpse Pose): Promotes profound relaxation.

2.3.7 Clinical Studies

Three weeks before the start of our investigation, the 38-year-old lady who served as the subject suffered an acute ischemic stroke. She had been using allopathic medications for her hypertension, which started with her pregnancy six years ago. She was sent home after ten days in the hospital following her stroke. She lived with her spouse and one little kid in an apartment in an urban setting. On September 27, 2023, she went to the CAM department at DSVV Haridwar, and the next day she began receiving outpatient rehabilitation treatment, which included *Yoga* therapy and acupuncture. She has done at-home physical treatment.

After obtaining her agreement, the pre-data questionnaires were completed on the first day. She had not received any supplementary therapy prior to the start of the trial. For 12 weeks, the *Yoga* therapy rehabilitation treatment was combined with acupuncture and physical therapy. Twelve weeks later, she completed the surveys once more for post-data collection. Following therapy, she reported improvements in her energy, mood, and mobility[59].

Researchers may learn a lot from this case study on how stroke patients react to an integrated rehabilitation strategy. We think this helps researchers and clinicians better understand the therapeutic effect of *Yoga* and other Complementary and Alternative Medicine (CAM) in stroke rehabilitation by doing more generalizable experimental studies with a wider population. This finding is corroborated by a pilot trial that showed that an 8-week *Yoga* intervention significantly improved pain, upper limb strength, hip and neck range of motion, and 6-min walk scores in individuals with chronic stroke[60].

2.4 U-*Unani*

The *Unani* system of medicine is among the oldest traditional medicinal systems that has worked to prevent and treat a wide range of illnesses over the years[61]. "Ionion," meaning "Greek," is the root of the term "*Unani*". The Greek philosopher Hippocrates and his colleagues are credited with founding *Unani* medicine, just as Western medicine. Hippocrates' theory placed a strong emphasis on the idea that the human body is an integrated, whole system. His approach to treatment was broad in scope and did not focus on particular symptom types. He investigated the causative relationships between illness incidence and variables including nutrition, drinking and eating habits, clothes, water, and climate[62]. "Greek Medicine" is what *Unani-tibb*, also known as *Unani* Medicine, or *Yunani* Medicine (in Arabic, Hindi-Urdu, and Persian). Its roots may be found in Greek literature, which has produced several scientific contributions. Arabs and Persians also advanced this complex medical discipline. Ever since, *Unani* medicine has been referred to as Greco-Arab medicine[63]. In order to address the health care requirements of the human population, the *Unani* System of Medicine (USM) has been acknowledged by the World Health Organization (WHO) as an alternative system. One of the most popular forms of traditional medicine is *Unani*, which is based on an old system[64,65].

A loss in cognitive and motor abilities results from the gradual destruction of neurons in these conditions, which include multiple sclerosis, Parkinson's Disease, and Alzheimer's Disease. Restoring equilibrium among the body's humours and using natural treatments to address the root causes of these ailments are key components of *Unani* medicine. Examples are given below.

2.4.1 Unani Treatment for Alzheimer's Disease

Since the accumulation or production of an excessive amount of abnormal phlegm in the brain is the main cause of Alzheimer's disease, renowned *Unani* scholars believe that the first step in treating the condition should be *Tanqiyah-e-dimagh*, or the removal of deranged material from the brain, using *Munziz* and *Mushil*. In addition to eliminating sick matter, tissue metabolism and its faculties – such as *Muhafizaat*, *Muslihat*, *Muqawwiyaat*, *Moaddilaat*, and *Munish-e-Haraarat Ghareeziyah*, which improve memory and have antioxidant capacity against reactive oxygen species, among others – may be increased. In addition to these, *Majoon-e-Baladur*, *Majoon-e-Nisyan*, *etc.*, might be utilised[66].

2.4.2 Unani Treatment for Parkinson

For successful and efficient care of PD, diagnosis is essential, particularly early in the illness's progression. There are both motor and non-motor symptoms associated with Parkinson's disease. Impulse control disorders are examples of non-motor symptoms that may need extra care and can have a catastrophic effect on patients and their families. Postural instability, bradykinesia, stiffness, and resting tremors are the four hallmarks of PD. Diagnosing secondary forms of Parkinsonism that have certain symptoms with PD can be made more difficult by stroke, tumours, poisonings or medications, and neurodegenerative diseases (Table 2) (Parkinsonian syndromes). Treatment and symptom management can start as soon as a diagnosis is confirmed[66,67].

2.4.2.1 Itrifal Muqawwi-e-Dimagh

It is a powerful *Unani* formulation with components that preserve dopaminergic neurons, which helps to lessen the symptoms of Parkinson's disease. Enhancing mental abilities, reducing oxidative stress, increasing antioxidant enzymes, improving tyrosine hydroxylase activity (an enzyme that aids in dopamine production in dopaminergic neurons), and improving cognitive

Table 2. Market preparation of *Unani* in neurodegenerative disorder

Sr. no.	Brand Name	Contain	Dosage	Uses
1	*Jujube (Ziziphus jujuba)*	*Ziziphus jujuba*	1-2 grams daily	Enhances cognitive function, reduces stress and anxiety
2	*Walnut (Juglans regia)*	*Juglans regia*	1-2 grams daily	Supports brain health, improves memory
3	*Indian Frankincense (Boswellia serrata)*	*Boswellia serrata*	1-2 grams daily	Anti-inflammatory, supports overall brain health
4	*Ginger (Zingiber officinale)*	*Zingiber officinale*	1-2 grams daily	Reduces oxidative stress, supports cognitive function
5	*Asafoetida (Ferula asafoetida)*	*Ferula asafoetida*	1-2 grams daily	Anti-inflammatory, supports brain health
6	*Indian Ginseng (Withania somnifera)*	*Withania somnifera*	1-2 grams daily	Neuroprotective, reduces stress and anxiety
7	*Gotu Kola (Centella asiatica)*	*Centella asiatica*	1-2 grams daily	Enhances cognitive function, improves mental clarity
8	*Prunella Vulgaris*	*Prunella vulgaris*	1-2 grams daily	Anti-inflammatory, supports brain health
9	*Lemon Balm (Melissa officinalis)*	*Melissa officinalis*	1-2 grams daily	Reduces anxiety, supports cognitive function
10	*Morinda Citrifolia (Noni)*	*Morinda citrifolia*	1-2 grams daily	Supports overall brain health, cognitive enhancer
11	*Ginkgo biloba*	*Ginkgo biloba*	60-120 mg daily	Enhances cognitive function, improves blood flow to the brain
12	*Bacopa monnieri*	*Bacopa monnieri*	300-600 mg daily	Enhances memory, reduces anxiety
13	*Licorice (Glycyrrhiza glabra)*	*Glycyrrhiza glabra*	1-2 grams daily	Anti-inflammatory, supports brain health
14	*Nigella sativa (Black Seed)*	*Nigella sativa*	1-2 teaspoons daily	Antioxidant, supports overall brain health
15	*Unani Majoon-e-Kabid*	Herbal formulation	5-10 grams daily	Enhances cognitive function, reduces anxiety
16	*Unani Sharbat-e-Sandal*	Herbal formulation	10-20 ml daily	Cooling effect, supports mental clarity
17	*Unani Itrifal Zamani*	Herbal formulation	5-10 grams daily	Supports cognitive function, improves digestion
18	*Unani Habbe Mumsik Motadil*	Herbal formulation	1-2 tablets daily	Enhances cognitive abilities, reduces stress
19	*Unani Roghan-e-Badam Shirin*	Almond oil	1-2 teaspoons daily	Nourishes the brain, supports cognitive function
20	*Unani Roghan-e-Kharateen*	Herbal oil	Apply externally as directed	Supports nerve health, reduces inflammation

Table 2. Continued...

21	*Unani Jawarish-E-Jalinus*	Herbal formulation	5-10 grams daily	Enhances memory, supports cognitive function
22	*Unani Roghan-E-Neelofar*	Herbal oil	Apply externally as directed	Reduces anxiety, promotes relaxation
23	*Unani Sharbat-E-Unnab*	Herbal formulation	10-20 ml daily	Supports brain health, improves mental clarity
24	*Unani Qurs-E-Zara'uni*	Herbal formulation	1-2 tablets daily	Enhances cognitive abilities, reduces stress
25	*Unani Roghan-E-Qust*	Herbal oil	Apply externally as directed	Reduces inflammation, supports nerve health
26	*Unani Khamira Abresham*	Herbal formulation	5-10 grams daily	Supports heart and brain health, improves memory
27	*Unani Habbe Jadwar*	Herbal formulation	1-2 tablets daily	Neuroprotective, enhances cognitive function
28	*Unani Arq Gulab*	Rose water	10-20 ml daily	Supports mental clarity, reduces stress
29	*Unani Majoon-E-Kundur*	Herbal formulation	5-10 grams daily	Enhances memory, supports cognitive function
30	*Unani Itrifal Ustukhuddus*	Herbal formulation	5-10 grams daily	Supports brain health, improves digestion
31	*Unani Qurs-E-Faruqi*	Herbal formulation	1-2 tablets daily	Enhances cognitive function, reduces anxiety
32	*Unani Dawa-ul-Misk Motadil*	Herbal formulation	5-10 grams daily	Supports brain health, improves memory
33	*Unani Roghan-E-Kaharuba*	Herbal oil	Apply externally as directed	Reduces inflammation, supports nerve health
34	*Unani Itrifal Kishneezi*	Herbal formulation	5-10 grams daily	Enhances cognitive function, supports mental clarity
35	*Unani Sharbat-E-Bazoori Motadil*	Herbal formulation	10-20 ml daily	Supports overall health, reduces stress
36	*Unani Roghan-E-Surkh*	Herbal oil	Apply externally as directed	Reduces inflammation, supports nerve health
37	*Unani Itrifal Mulayin*	Herbal formulation	5-10 grams daily	Enhances cognitive function, supports brain health
38	*Unani Roghan-E-Luban*	Herbal oil	Apply externally as directed	Supports nerve health, reduces inflammation
39	*Unani Majoon-E-Falahud Dhimagh*	Herbal formulation	5-10 grams daily	Supports brain health, improves memory
40	*Unani Roghan-E-Tukhm-e-Baiza Murgh*	Herbal oil	Apply externally as directed	Enhances cognitive function, supports mental clarity

dysfunctions, mental functions, and vision are all advised. It is advised to take 20 grams every day[68].

2.5 S-*Siddha*

One of the earliest traditional medicinal systems in India is *Siddha*, which originated in South India about 5000 CE. The whole literature of this Dravidian-originated culture is written in Tamil. Local customs that have their origins in the ancient Dravidian civilisation are having an impact on this system. *Siddhars*' (ancient academics') intuitions are thought to be scientifically reflected in the *Siddha* system. In accordance with the *Siddha* literature, eighteen *Siddhars,* who lived in various eras in southern India, developed their remedies for a range of illnesses. These remedies are currently accessible in the form of written books and manuscripts made of palm leaves. *Siddha* is one of the oldest indigenous health traditions, hence, it is essential to effectively conserve and advance it in the near future[69].

Since ancient times, Tamil people have widely adhered to the *Siddha* system, also known as Tamil *Maruthuvam*. The *Siddha* system's primary raw resources include minerals, herbs, and animal items. According to Hindu belief, perfected masters who have transcended the ahamkara (ego or Imaker), subdued their minds to be subservient to their awareness, and changed their bodies – which were primarily composed of dense *Rajotama gunas* – into a different kind of bodies dominated by sattva are referred to as *Siddha*,

which has the meaning "one who is accomplished" or "established truth." Usually, it takes a lifetime of consistent meditation to achieve this[70].

Tamil Nadu, South India, is home to the *Siddha* System of Medicine (SSM), an antiquated medical system. *Siddha* is derived from the Tamil word meaning perfection. The *Siddha*s were those who achieved the pinnacle of intellectual excellence. *Siddha* medications halt the body's cell deterioration. Breathing and nutrition regulation are recommended by the *Siddha* system. *Yoga* and meditation are incorporated into the framework[71].

The *Siddha* medical system uses natural or so-called crude forms of plant, animal, and mineral-based medications either alone or in combination to create compound preparations. Medications made from plants, especially herbaceous plants, are frequently utilised in whole plants or their components, such as wood, bark, exudates, gums, flowers, seeds, fruit varieties, stems, and roots. These mixtures are either eaten fresh or in juice, or they are dried. The *Siddha* system also includes *churnas, bhasma, kwatha, taila,* pills, and ointments as dose forms.

As a fundamental therapy, the choice of appropriate herbs with the required tastes that balance humours is a crucial part of every *Siddha* composition. The foundation for treating diseases (deranged humours) (*vipaakam*), according to the *Siddha* method, is the selection of herbs that have the capacity to correct deranged humours by virtue of their opposing action, which is based on their *suvai* (taste), *veeryam* (potency), and taste after digestion. Earth, water, fire, air, and space are the panchabootham components, and each taste is a combination of these elements. The human body is composed of similar panchabootham components as well[72]. Multiple sclerosis, Parkinson's disease, Alzheimer's disease, and other neurological diseases may be managed with the use of *Siddha* medicine, an age-old therapeutic method from Tamil Nadu, India. *Siddha* treatment aims to slow the progression of the disease, its symptoms, and the overall function of the brain, even if it might not offer a full cure.

2.5.1 Psychiatry in Siddha Medicine

According to *Siddha* "psychiatry" (*kirugai marutthuvam*), mental illnesses might be understood scientifically. It rejected the doctrine of demonology that had afflicted the West for millennia. Age, sex, dietary habits, seasonal change, and constitutional makeup were all shown to contribute to the potential tendency to mental disease[73].

The neuropsychiatry of the *Siddha* medical system, *Kirigai Maruthuvam*, was proposed by a number of *Siddhars*, the most well-known of whom are *Agasthiyar, Yugimunivar*, and *Theraiyar*. They give phenomenological descriptions. In the *Siddha* system, 96 *Thatthuvangal* (Philosophy) discusses human physiology. Among the 96 *thatthuvam*, mental health is the responsibility of *Maṉam* (mind), *butthi* (wisdom, decision making), *chittham* (determination), and *muṉaippu* (accomplishment). *Maṉam's* inherent character is *Muṉaippu*. The mind, or *manam*, is in charge of self-realisation, planning, reasoning, and thought[74].

Inseparable and interdependent are the mind and body. Manam can be executed as well as received. A number of variables, including improper diet, seasonal fluctuations, physical illnesses, and substance addiction, can contribute to mental illness. The three humours are affected by those elements. Particularly, *vali, azhal,* and *iyyam* can be deranged, or *Azhal* humour can frequently outweigh the other two, which can lead to *mana noigal* (mental disorders).

Agathiyar maanidar kirigai nool and *yugi* chinthamani-800 are noteworthy psychiatric literatures in the *Siddha* system. They classified the clinical variety of mental illness based on symptomatology. It correlates with modern psychiatric illnesses like depression, schizophrenia, mania, convulsive disorders, neurotic illness, drug dependence and toxic psychosis, *etc*[75].

2.5.2 Clinical Studies

Molecular docking experiments were conducted on the binding of the target GABAA receptor for ten phytoconstituents extracted from the plants in order to identify a possible medication candidate for the treatment of epilepsy and anxiety. Each of these ten compounds was docked to the GABAA receptor. When it comes to the enzyme's activity and related biological effect, binding energy decides whether the desired leads tend to occupy the target amino acid residues. 25 Throughout the phytocompound docking investigations, every analogue exhibited strong binding interactions with the GABAA receptor

(binding energy ranging from -3.23 kcal/mol to -7.66 kcal/mol).

According to the data, the phytoconstituents with the highest docking scores were Quinic acid, Betulonic acid, Chebuloside, and Maslinic acid, which showed respective values of -7.66 kcal/mol, -6.63 kcal/mol, -6.46 kcal/mol, and -6.07 kcal/mol. Contrarily, epicatechin, curcumin, vasicinone, gallic acid, and luteol showed a modest affinity for binding to the target protein, with binding energies of -5.52, -4.94, -4.50, -4.44, and -4.39 kcal/mol, respectively.

According to the herb's published research, the phytochemical chemoside has three interactions with the four-target core active amino acid residues on the GABA-A receptor, representing 75% of the binding effectiveness. Then came other compounds like oleic acid, curcumin, gallic acid, maslinic acid, betulonic acid, lupeol, quinic acid, epicatechin, and vasicinone, which came in second place with two interactions out of four target amino acids with the target protein's active site, accounting for half of the binding efficacy between the two[76].

Out of the 276 clinical studies that were registered, the majority were suggested to be undertaken in the fields of psychiatry and cancer. A maximum of 24.5% of the clinical trials were financed by pharmaceutical companies, and the majority of them (87.75%) were conducted at single centres. Nearly all of the clinical trials were investigator-initiated. Randomised controlled trials accounted for about 85% of the research, with the vast majority of the study types being interventional (Table 3). On the other hand, only 27.4% of respondents suggested using a suitable randomisation technique, while only 5.5% of respondents did so. Only 1% to 2% of the finished investigations were published, and across all domains, the average rate of retroactive registration was 23.6%[77].

2.6 H-*Homoeopathy*

Based on the premise that "like cures like," *Homoeopathy* is a comprehensive medical system that was founded by Samuel Hahnemann in the late 1700s. This idea suggests that a medicine that can produce symptoms in a healthy person can also alleviate equivalent symptoms

Table 3. Market preparation of *Siddha* in neurodegenerative disorder

Sr. No.	Brand Name	Contain	Dosage	Uses
1	*Naga Chendurum*	Herbal formulation	100-200 mg twice daily	Enhances cognitive function, supports brain health
2	*Karpasanam*	Herbal formulation	500 mg twice daily	Reduces anxiety, supports mental clarity
3	*Vayu Guligai*	Herbal formulation	1 tablet twice daily	Supports cognitive function, improves memory
4	*Thandai*	Herbal formulation	5-10 grams twice daily	Anti-inflammatory, supports overall brain health
5	*Brahmi Vati*	Bacopa monnieri extract	250-500 mg twice daily	Enhances memory, reduces anxiety
6	*Ashwagandharishtam*	Withania somnifera extract	15-30 ml twice daily	Neuroprotective, reduces stress and anxiety
7	*Saraswatarishtam*	Herbal formulation	15-30 ml twice daily	Enhances cognitive function, calming effects
8	*Drakshadi Kashayam*	Herbal formulation	15-30 ml twice daily	Supports overall brain health, reduces oxidative stress
9	*Brahmi Ghritam*	Bacopa monnieri, Ghee	1-2 teaspoons daily	Enhances cognitive function, improves memory
10	*Kalyanaka Ghritam*	Herbal formulation	1-2 teaspoons daily	Supports brain health, promotes overall well-being
11	*Chyawanprash*	Herbal formulation	1-2 teaspoons daily	Antioxidant, supports overall health and vitality
12	*Vacha Churna*	Acorus calamus powder	125-250 mg twice daily	Enhances cognitive function, supports mental clarity
13	*Manasamitra Vatakam*	Herbal formulation	1-2 tablets twice daily	Reduces stress, anxiety, and enhances cognitive functions

Table 3. Continued...

14	*Smriti Sagar Rasa*	Herbal formulation	1-2 tablets twice daily	Enhances cognitive abilities, supports mental clarity
15	*Dronapushpi Churna*	Leucas cephalotes powder	1-2 grams twice daily	Improves memory, supports mental clarity
16	*Mandukaparni Churna*	Centella asiatica powder	1-2 grams twice daily	Enhances cognitive function, reduces stress and anxiety
17	*Ashtavarga Churna*	Herbal formulation	1-2 grams twice daily	Supports overall brain health, enhances cognitive function
18	*Saraswatha Ghrita*	Herbal formulation	1-2 teaspoons daily	Enhances cognitive function, calming effects
19	*Shankhapushpi Churna*	Convolvulus pluricaulis powder	1-2 grams twice daily	Enhances cognitive function, reduces stress and anxiety
20	*Yashtimadhu Churna*	Glycyrrhiza glabra powder	1-2 grams twice daily	Anti-inflammatory, supports brain health
21	*Brahmi Thailam*	Bacopa monnieri oil	Apply externally as directed	Enhances memory, supports mental clarity
22	*Amalaki Rasayana*	Emblica officinalis powder	1-2 grams twice daily	Antioxidant, supports overall brain health
23	*Kalyanaka Kashayam*	Herbal formulation	15-30 ml twice daily	Supports brain health, enhances memory and cognition
24	*Dashamoola Rasayana*	Herbal formulation	1-2 grams twice daily	Anti-inflammatory, supports overall brain health
25	*Rasayana Churna*	Herbal formulation	3-6 grams daily	General tonic, supports overall brain health
26	*Vidarikand Churna*	*Pueraria tuberosa* powder	5-10 grams daily	Improves cognitive functions, supports brain health
27	*Jyotishmati Churna*	Celastrus paniculatus powder	300-600 mg daily	Enhances memory, reduces cognitive decline
28	*Nirgundi Churna*	Vitex negundo powder	500-1,000 mg twice daily	Anti-inflammatory, neuroprotective
29	*Agastya Rasayana*	Herbal formulation	1-2 teaspoons daily	Supports respiratory health, enhances cognitive function
30	*Drakshadi Lehyam*	Herbal formulation	1-2 teaspoons daily	Supports overall health, reduces oxidative stress
31	*Triphala Churna*	Herbal formulation	1-2 grams twice daily	Supports digestion, enhances cognitive function
32	*Pippali Rasayana*	Piper longum powder	1-2 grams twice daily	Supports respiratory health, enhances cognitive function
33	*Amukkara Churna*	*Withania somnifera* powder	1-2 grams twice daily	Neuroprotective, reduces stress and anxiety
34	*Gowthari Rasayana*	Herbal formulation	1-2 grams twice daily	Supports overall brain health, enhances cognitive function

in a sick person when administered in a very diluted dosage. Through a process called potentisation, which comprises repeated dilution and succussion (violent shaking) of the original substance, the remedies are created. Even when the dilution reaches Avogadro's number, this method is expected to enhance the remedy's curative benefits while limiting any possible detrimental effects. *Homoeopathy* is founded on a holistic concept that addresses the patient as a whole, taking into consideration their mental, emotional, and physical states, as opposed to only treating individual symptoms. Numerous patients and practitioners claim gains in general well-being and symptomatic alleviation following homoeopathic therapies, despite continual disputes over its scientific validity. *Homoeopathy* is utilised as a stand-alone therapy for mild disorders and as a supplementary method with traditional medicine for more serious problems. Perception, cognition,

memory, and decision-making are all made possible by cognitive function, which is fundamental to day-to-day functioning. Attention, memory, language, problem-solving, and decision-making are all components of this complicated talent, which is important for successful learning, work, social involvement, and communication. When cognitive function deteriorates, as it does in disorders like dementia, Alzheimer's disease, and other neurodegenerative conditions, daily tasks can become challenging, and quality of life may be significantly jeopardised. Understanding how vital cognitive function is to retaining autonomy and mental well-being, scientists have started looking at creative approaches to increase brain function, such as the prospective use of homoeopathic therapies.

It is considered that homoeopathic therapies act by encouraging the body's inherent healing mechanisms and deeply re-establishing homeostasis. When it comes to cognitive function, the "like cures like" approach drives the choice of therapies that share symptoms with the patient's cognitive diseases. Potentization is considered to boost the remedy's energy properties and may interact with the body's life force to aid healing. While the particular mechanisms are still unknown, preliminary research, systematic reviews, and anecdotal evidence point to the likelihood that *Homoeopathy* can boost brain health by addressing underlying imbalances that contribute to cognitive decline. Though it can be used in conjunction with other therapies to increase overall well-being, *Homoeopathy* is not indicated as a stand-alone treatment for severe cognitive deficits.

Apart from increasing cognitive function, *Homoeopathy* is also being explored for its prospective applicability in the treatment of neurodegenerative disorders. Neuronal cell death brought on by acute or chronic stress is a distinguishing hallmark of these illnesses, which include Parkinson's and Alzheimer's Diseases. The clinical symptoms of various illnesses vary depending on the exact brain locations that are damaged. An alternative method is to employ the homoeopathic potency of neurotrophic factors. Although neurotrophic factors are proteins that assist the growth, survival, and function of neurons, hurdles like the blood-brain barrier and transport degradation typically make it impossible to directly give them. The body's natural manufacture of neurotrophic chemicals may be improved by utilising these components in homoeopathic dilutions, which would promote their dispersion throughout the central nervous system and help in the protection and repair of neurones[78].

Moreover, *Homoeopathy* has been examined in association with the theory of hormesis, a non-linear dose-response relationship evident in toxicology and pharmacology. Low quantities of chemicals stimulate beneficial survival pathways, whereas excessive doses impair biological systems. This mechanism is known as hormesis. According to this notion, neuronal survival mechanisms may be minimally activated to avoid or minimise neurological disorders, especially in elderly patients who need better brain function without the terrible side effects that are commonly associated with increased doses of therapeutic medications. Even though the efficiency of non-linear dose-response effects in preventing or treating neurological disorders is still up for discussion, understanding of these differences in neuronal responses may inspire alternative therapeutic techniques. Homoeopathy is a holistic and customised approach to treatment that tries to boost the body's innate healing capacities through the ideas of "like cures like" and potentization. Its ability to boost cognitive performance by correcting minor imbalances and enhancing general brain health is an area of considerable attention, particularly as a supplemental treatment alongside conventional therapy. While disagreements on its usefulness exist and the mechanisms of action remain a focus of research, early studies and systematic reviews give intriguing insights. Moreover, unique applications, such as the utilisation of neurotrophic factors in *homoeopathic* potency and the discovery of hormetic responses, underline the need for further thorough investigations. Ultimately, while *homoeopathy* should not replace conventional therapies for major cognitive or neurodegenerative illnesses, it may serve as a vital supplement in the effort to enhance cognitive function and quality of life.

Consumers currently take a number of dietary supplements – including vitamins, amino acids, and fish oil – that may alter mood and general functioning. Although the evidence supporting the use of vitamins, antioxidants, and amino acids as stand-alone therapies for mental symptoms is not substantial, preliminary studies have shown potential when these agents are administered as adjuncts. For instance, folate, tryptophan, and phenylalanine have been examined for

their potential to boost the efficiency of conventional antidepressants in treating depression. Additionally, S-adenosylmethionine (SAMe) appears to have inherent antidepressant effects, whereas omega-3 polyunsaturated fatty acids, notably Docosahexaenoic Acid (DHA), may give mood-stabilising advantages. Given these discoveries, additional study is necessary to explain the role of these natural compounds in preventing and treating mental disorders[79].

Malnutrition may seriously impair cognition and general functioning, and depression is frequently associated with inadequate nutrition. The decline linked to these conditions may be avoided with early identification and treatment of dietary deficiencies. The function of L-tryptophan in neuropsychiatric diseases provides a powerful illustration. Tryptophan, an important amino acid and a precursor for the brain's manufacture of serotonin, has been used in mental patients' diets with varying degrees of efficacy. Following a 20 mg oral dosage of citalopram, a recent study showed that a 200 mg dose of L-5-hydroxytryptophan (L-5HTP) significantly increased the Area Under the Curve (AUC) for prolactin and cortisol responses over three hours. The notion that such supplementation could function as an effective adjunct therapy in the treatment of depression and possibly dementia is supported by these findings, which imply that an augmented neuroendocrine challenge may be a helpful marker for increased serotonin-mediated responses. However, more thorough research is necessary. There is curiosity in whether poor vitamin B12 or folate status may contribute to or aid in preventing cognitive decline, since elevated plasma homocysteine levels have been linked to dementia and cognitive impairment. Numerous investigations on the connection between homocysteine levels, cognitive function, and B-vitamin status have used cross-sectional or case-control methods, which raises the potential that the associations found may be an effect of the disease rather than its cause. Because folic acid and vitamin B12 supplements can lower homocysteine levels, which suggests that these vitamins may lessen the risk of dementia, the homocysteine hypothesis of dementia has attracted attention. Recent studies, however, have shown conflicting findings. For instance, a study that tested high-dose B vitamins did not reduce cognitive deterioration in people with mild-to-moderate Alzheimer's disease. Likewise, there has been no discernible benefit above placebo in placebo-controlled studies using vitamin B12, folic acid, or vitamin B6 in lowering the prevalence of clinically severe depression or depressed symptoms in older males. While vitamin B6 supplementation did enhance biochemical markers of vitamin B6 sufficiency in older people, a recent Cochrane analysis also showed no evidence of short-term advantages from vitamin B6 in enhancing mood or cognitive abilities. Although further randomised, controlled trials are required to elucidate the advantages of folate supplementation in both persons with normal folate levels and those with deficiencies, it is nevertheless of interest as a possible adjuvant in treating depression in spite of these findings[80].

According to homoeopathic medicine, several components are known to be necessary for appropriate physical construction, and inadequacies in these components, whether they be quantitative or qualitative, can lead to psoric disorders that mainly affect the neurological and emotional body. For instance, zinc is one of these elements, and the metal itself is triturated to create the homoeopathic medicine Zincum metallicum. Zincum metallicum has been shown in animal experiments to have the ability to slow down neuronal damage in Parkinsonism, especially in rat models. The primary outcome measures in these investigations, including distance travelled, locomotor activity, and stereotyped movements, showed that rats in the lesion group were less active than controls, indicating that Zincum metallicum could help prevent PD. According to homoeopathic repertories, Zincum metallicum is one of the best treatments for Parkinson's disease. Clinical indications include lameness, generalised muscular weakness, convulsions with pallor and no heat, chorea from suppressed eruptions, violent whole-body trembling after emotional disturbances, and trembling of the hands when writing, especially during menstruation. Additional indications for the medication include persistent foot motion, discomfort from touch, late afternoon or after meals, and relief after eating or after discharges. In contemporary medicine, anticholinergic medications are commonly used to treat Parkinson's disease. While these medications are successful in reducing symptoms, they can have a number of negative side effects, including

dry mouth, impaired gastrointestinal motility, and bladder problems. It is considered both compatible and advantageous from a homoeopathic standpoint to combine homoeopathic medicines with conventional therapies such as L-dopa. In patients currently on L-dopa, homoeopathic remedies might help reduce adverse effects such as nausea, low blood pressure, restlessness, sleepiness, and cardiac arrhythmias. In the early stages of the illness, *Homoeopathy* may help stabilise the condition and slow its development. In order to lessen tremors, stiffness, and other Parkinson's disease-related issues, the main objective is to lower the amount or strength of anticholinergic drugs[81,82].

Homoeopathic treatment for neurological disorders begins with a comprehensive assessment of the patient's physical and mental symptoms, which is followed by the administration of a customised homoeopathic remedy intended to promote the body's natural healing mechanisms. This procedure frequently entails spending a lot of time with patients, which might lead to better healing results. The brain, spinal cord, and nerves make up the nervous system, which communicates with the rest of the body, senses changes in the environment, and cooperates with the endocrine system to keep the body in a state of homeostasis. Neurological illnesses significantly affect everyday living and social functioning. They can range from paralysis and muscular weakness to poor coordination, loss of feeling, and seizures. Deficits in speaking, writing, and memory can be signs of ADHD, autism, dyslexia, and other behavioural problems in youngsters, whereas Parkinson's and Alzheimer's disease frequently develop in older persons as a result of accumulated mental and physical stress. Additional ailments that highlight the wide-ranging effects of neurological diseases include cluster headaches, migraine headaches, and sleep disturbances. Neuropathy and Homoeopathic Zinc, the writer is Dr. Partha Pratim Pal. Issue 3(1) of the International Journal of Homoeopathic Sciences, 2019 Link: International Journal of Homoeopathic Sciences Acquired. Robin Murphy's work serves as an example of the Homoeopathic Medical Repertory, which is a thorough clinical and experimental database for homoeopathic medicine. A clinical and traditional approach to diagnosis and treatment is emphasised by this repertory, which incorporates the ideas of Boger's pathological generals, Boenninghausen's full symptoms, Kent's generals, and other traditional prescription frameworks. This repertory is useful because it focuses on clinical diagnosis, which enables practitioners to choose treatments that target the entirety of a patient's symptoms in a focused and holistic way. In conclusion, the potential benefits of homoeopathic treatments and nutritional supplements for improving mood, cognitive function, and the treatment of neurological conditions are being investigated. Although natural products, including omega-3 fatty acids, folate, SAMe, and tryptophan, have the potential to be useful as supplementary therapy for depression and cognitive decline, further study is required to confirm these advantages. Zincum metallicum and other homoeopathic therapies are showing promise in treating Parkinson's disease at the same time, especially when combined with traditional treatments like L-dopa. Finally, a multidisciplinary strategy that combines homoeopathic, pharmaceutical, and dietary approaches may provide the most thorough way to address the intricate interactions between the variables that cause neurological and mental illnesses[83,84].

2.6.1 Homoeopathy for ALS

Instead of repairing pre-existing damage, homoeopathic remedies assist in regulating subsequent deterioration, which helps alleviate symptoms of progressive neuromuscular diseases like Amyotrophic Lateral Sclerosis (ALS). These treatments are very helpful for mild to moderate instances, and each patient's care is tailored after a thorough case study by a licensed homoeopathic practitioner. Because choosing the right solution needs a great deal of clinical knowledge and experience, self-medication is discouraged. For instance, plumbum met is thought to be a very good treatment for atrophy, loss of function, or muscular weakness. It is particularly helpful when there is twitching of the muscles in the limbs, lameness, and weakening of the arms and hands. Those who experience chilly hands and feet can also benefit from this cure, which is also recommended for the loss of muscular function in the lower limbs, including the hand, wrist, and forearm, especially on the right side. Furthermore, plumbum met is recommended in situations of stuttering speech or voice loss, as well as in the early stages of muscular dysfunction, when cramps precede a gradual loss of muscle structure. Likewise, argentum nitricum helps

those who have lower limb weakness, when their legs, especially the left leg – feel heavy, hard, or stiff. People who require this treatment frequently have a stumbling, tottering, and unstable walk, perhaps with leg muscle atrophy and forearm weakness. Along with these symptoms, a raspy voice may also be present. Lachesis, on the other hand, is commonly taken into consideration in situations characterised by sluggish, difficult, and muddled speaking, where people may find it difficult to pronounce specific words, which can occasionally result in voice loss. *Lachesis* is also useful for treating swallowing issues, namely those that involve swallowing liquids more difficultly than solids. For the treatment of general limb weakness, phosphorus is another effective treatment. When there is significant arm weakness that makes movement extremely difficult and a discernible decrease in hand muscular mass, it is especially suggested. In the lower limbs, phosphorus helps relieve a feeling of weakness and heaviness that is frequently made worse by ascending steps. The legs of affected people may become extremely weak, causing them to trip or walk unsteadily. In situations where speech becomes weak, sluggish, and challenging, this treatment is also beneficial. Although homoeopathic remedies cannot undo the harm already done in diseases like ALS, they may be very helpful in controlling symptoms and maybe slowing the disease's course. The chosen remedies – plumbum met, argentum nitricum, lachesis, and phosphorus – are determined by the symptom profile and general clinical presentation of each patient, highlighting the necessity of individualised care and expert consultation in *Homoeopathy*[85].

Both people and society are heavily burdened by neurodegenerative illnesses, including Alzheimer's, Parkinson's, and Huntington's, and traditional therapies frequently fall short of expectations. *Homoeopathy* provides a distinctive alternative method by using the potentization process and the "like cures like" principle to activate the body's self-healing systems. Here, homoeopathic potency is employed to promote the body's natural synthesis of neurotrophic factors, which are essential proteins involved in neuronal development, survival, and function. By overcoming obstacles, including the Blood-Brain Barrier (BBB) and degradation during direct injection, this method may improve the distribution of neurotrophic factors in the central nervous system. The long-held notion that the brain is a static organ with a certain number of neurons and synapses has been disproved by recent studies. Rather, it is now recognised that the brain is dynamic and sensitive to environmental factors throughout life. By controlling cell proliferation, differentiation, synaptogenesis, and synaptic plasticity, neurotrophic factors – such as Brain-Derived Neurotrophic Factor (BDNF), Nerve Growth Factor (NGF), neurotrophin 3 (NT3), and neurotrophin 4 (NT4) – are essential for preserving neuronal health. In addition to being a natural aspect of ageing, changes in the amounts of these substances and their receptors are also linked to the aetiology of mental and neurological diseases. Higher BDNF levels, for instance, are linked to a slower rate of cognitive decline in Alzheimer's disease, whereas lower BDNF and Glial Cell Line-Derived Neurotrophic Factor (GDNF) levels are linked to dopaminergic neurone degeneration and the onset of both motor and non-motor symptoms in Parkinson's disease. The goal of homoeopathy's neurotrophic factor potency technique is to stimulate the body's innate synthesis of these proteins. Because the homoeopathic preparation may be able to overcome these delivery barriers through potentisation, this approach offers a possible remedy for the challenges associated with transporting big molecules, such as neurotrophic factors, across the blood-brain barrier. This strategy may boost neuronal development, survival, and general brain function by raising endogenous levels of neurotrophic factors, providing a potentially effective adjunctive therapy for neurodegenerative illnesses. In conclusion, *Homoeopathy* offers a strong alternative approach to treating neurodegenerative diseases, even if a more thorough study is required to determine the clinical effectiveness and underlying processes. It could be feasible to boost the body's natural regenerating abilities by employing neurotrophic substances in homoeopathic potency, which would eventually improve neuronal health and function in situations when traditional therapies have had little effect[86].

Since ancient times, liquorice root has been used for its medicinal qualities and as a flavouring in food, tobacco, and herbal remedies. Although it has historically been used to treat infections, neurological conditions, peptic ulcers, and asthma, more recent studies have shown that it has a wider range of

therapeutic uses. Flavonoids (like isoliquiritigenin [ISL], liquiritigenin, liquiritin, and LQapioside), isoflavonoids (like dehydroglyasperin C [DGC]), and triterpenes (especially Glycyrrhizic Acid [GA] and glycyrrhetinic acid monoglucuronide [GM] (Figure 1) are among the many active compounds found in the root that have antimicrobial, anti-inflammatory, antioxidant, antispasmodic, and even anti-cancer properties. The main cause of licorice's unique sweet flavour is GA. Both acute neurotoxicity, such as in ischaemic stroke, and chronic neurodegeneration, like in Parkinson's and Alzheimer's diseases, are influenced by these substances through a variety of signalling pathways[87].

Glabridin and GA, two substances derived from liquorice, have shown notable neuroprotective benefits in animal models of ischaemic brain stroke. Glabridin has been demonstrated to improve endogenous antioxidant levels and decrease cellular apoptosis in order to modify brain damage brought on by middle cerebral artery occlusion (MCAO). By controlling the activation of microglia and astrocytes, liquorice extracts have also been shown to decrease the size of infarctions and lessen inflammatory reactions after therapy. Additionally, research has shown that liquorice can decrease the release of lactate dehydrogenase under hypoxic settings, improve superoxide dismutase activity, and block neuroexcitatory damage – all of which contribute to its protective function against ischaemic injury. In addition, GA has been shown to decrease neuroinflammation and oxidative stress by inhibiting the HMGB1-TLR4-IL-17A signalling pathway, lowering macrophage infiltration, and modifying ferroptosis-related pathways. The neuroprotective benefits of liquorice also extend to Alzheimer's Disease (AD). Progressive neuronal loss, abnormal protein aggregation, and persistent neuroinflammation are the hallmarks of AD. Key inflammatory pathways have been demonstrated to be inhibited by GA, particularly by preventing NF-κB activation, which is essential for the neurodegenerative process. GA helps alleviate neuronal loss by inhibiting apoptotic cascades and decreasing glutamate-mediated NMDA receptor signalling. ISL and GM, two other liquorice ingredients, have also shown promise in reducing microglial activation, modifying inflammatory indicators, and reducing toxicity caused by amyloid peptide. Moreover, liquorice possesses anticholinesterase activity, which has been linked to improvements in cognitive indicators in animal models. This suggests that liquorice may help

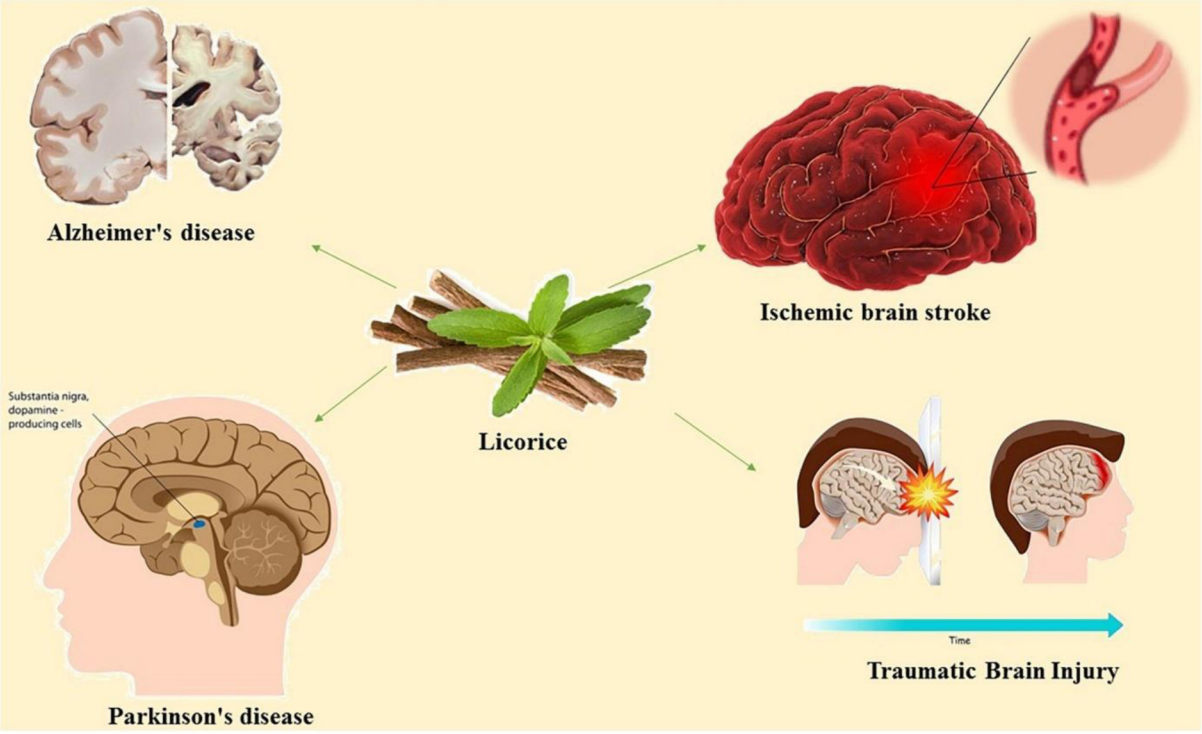


Figure 1. Diagrammatic representation of liquorice's impact on neurological conditions.

reverse forgetfulness and other cognitive impairments linked to AD[87].

2.6.2 Case Study 1

On September 1, 2018, a 72-year-old woman was brought by her relatives to the National Homoeopathy Research Institute in Mental Health, Kottayam, Psychiatry Outpatient Department. Sleeplessness, irrelevant talking, anger, memory loss, poor personal cleanliness, and a propensity to wander from home were among the symptoms the patient had. Her sister's and daughter's information was regarded as trustworthy. Her problems started subtly 15 years ago, and following a stressful incident involving a disagreement with her spouse over a land property issue, they became much worse. Given her already tense relationship with her son and daughter-in-law, who had allegedly mistreated and even physically harmed her, she was startled when her husband, in this case, transferred all of his holdings to his son without telling her. She seemed to have given up on her emotions after this incident, and her memory, sleep, and ability to speak clearly gradually deteriorated. The patient had erratic emotions that cycled between elation and melancholy, as well as physical and mental restlessness. She was seen crying during conversations about happy memories and giggling inappropriately when narrating terrible situations. Hiccups were the first signs of mental disorders, which were followed by involuntary hand movements, muttering, and heightened irritation.

The patient was regarded as kind, self-sufficient, and diligent before her sickness started. She was reticent by nature and frequently sat by herself thinking about insignificant things. She only drank one or two glasses of water a day and had a terrible appetite. Her sleep was extremely disrupted, averaging just two to three hours per night with frequent awakenings, even though she had regular bowel movements. She didn't sweat much, even while she was exerting herself, and she didn't have any particular dietary cravings other than a dislike of spicy foods. She was ambithermal, yet she liked both being covered and being under fans. Although no other notable anomalies were found, the patient's physical examination revealed that they were slender, lean, dark-complexioned, and ill-groomed. She was aware, dishevelled, uncooperative, and reticent during the mental status evaluation, yet she kept eye contact. Psychomotor activity was elevated, and interpersonal interactions were noticeably lacking. Despite being presented at a regular volume, tone, and pace, her speech was unimportant. There were instances of smiling while talking about sad occurrences and crying while talking about happy ones, demonstrating the inappropriate and reactive affect. Although she subjectively reported feeling down, there was no discernible objective effect. Her reasoning was irrational, even though her ideas often flowed normally. She was confused about time, location, and people, and there were occasional second-person audio hallucinations. She showed weak general knowledge, intellect, focus, and abstract thought, and her memory was severely damaged across immediate, recent, and remote recall. She lacked social awareness and problem-solving skills, showed little understanding of her situation, and denied any disease outright. The patient was diagnosed with unspecific dementia (F03- according to ICD-10) by the consultant psychiatrist based on her clinical presentation and examination. The absence of some symptoms required for an Alzheimer's disease diagnosis, such as quick onset, aphasia, agraphia, alexia, acalculia, and apraxia, as well as the long-term, steady deterioration in cognitive abilities, supported the diagnosis. The absence of a history of depression ruled out pseudodementia, and the gradual development and lack of motor or sensory abnormalities ruled out conversion disease. Using the Mini-Mental State Examination (MMSE), cognitive screening revealed a baseline score of 10, which indicates significant cognitive impairment. For a year, monthly MMSE evaluations were used to track the patient's development. RADAR 10 (Synthesis Repertory) software was used to perform a thorough examination of all of her symptoms. On the initial appointment, a single dose of Ignatia 200 was administered due to the combination of her symptoms and the noticeable accompanying symptom of hiccups. The medication was supplied by the institutional pharmacy after being purchased from HOMCO (Kerala State Homoeopathic Pharmacy). Following the administration of Ignatia 200, no homoeopathic aggravation was seen. Significant improvements in memory, sleep, attention, and focus were noted by the patient and her bystanders throughout the course of the following follow-up appointments. The therapeutic effects of the cure were then permitted to continue, and in order to sustain the

reaction, an identical placebo was added. Every time there was a plateau in improvement, Ignatia 200 was repeated. With the exception of general counselling from the conventional medicine doctor, the patient did not get any further conventional or alternative drugs or specialised behavioural treatments over the course of therapy. The Modified Naranjo Criteria for *Homoeopathy* were used to assess the causal attribution of the benefits to the homoeopathic intervention. The results showed a likely link with a score of 7. Over the course of the 12-month follow-up period, the patient's MMSE score continued to improve, rising from 10 at baseline to 24 in just six months. The patient's emotional stability was restored, her general functioning improved, and she was able to perform daily routine activities with near-normal independence in addition to the notable cognitive improvement. This example demonstrates the lasting improvement shown over one year after starting therapy with Ignatia 200 and the potential effectiveness of customised homoeopathic treatment in treating the symptoms of unspecific dementia[88].

2.6.3 Case Study 2

In order to optimise the overall quality of life, the main methods for controlling neurodegenerative illnesses include a balanced diet, frequent physiotherapy sessions, a comprehensive medication regimen, hygienic-dietary measures, and an active exercise regimen. Many patients still show varying degrees of impairment a few years after the disease starts, despite significant advancements in recent years in the treatment of these conditions. Reducing secondary inadequacies, such as disablement, and managing psychomotor impairments at the somatic and cerebral levels are the primary goals of physical rehabilitation. The processes involved in physical therapy are essentially a complicated collection of medical, ergotherapeutic, psychotherapy, socio-psychological, social, and educational measures. By creating a customised physical therapy and rehabilitation program for each patient, these goals can be met. This program should be tailored to the patient's psychological and social status, secondary deficiencies that may arise, potential for compensation, severity of the condition, and family environment support. Neurodegenerative disease treatment is based on the multiple etiopathogeneses of the pathology, and a syncretic-integrative approach is necessary for patient care. Physical therapy, psychotherapy, and somatotherapy – which is the mainstay of treatment and mostly medication – are all included in this strategy along with a suitable supplemental or supporting treatment. Based on a precise functional evaluation, functional therapy is a collection of auxiliary treatments used in physical therapy. In order to preserve the patient's physical activity and quality of life and enhance the overall prognosis of the illness, physical therapy and rehabilitation are essential. It is critical to identify the condition early, diagnose it, and determine its type and form. Using a thorough approach in the creation of kinesitherapeutic programs, the therapy should adhere to a rigorous sequence of rehabilitation algorithms and be customised to the unique characteristics of each patient. The White Book on Physical and Rehabilitation Medicine in Europe (2006) states that rehabilitation activities are a complex system of medical, prophylactic, social, educational, training, and psychological procedures that are intended to achieve the fullest possible physical and mental recovery in order to foster social independence and community participation. A comprehensive approach to the patient is essential in contemporary rehabilitation, based on a range of cognitive skills (such as orientation, attention, memory, and teamwork in carrying out medical procedures), the amount and scope of movement (passive and active), muscle strength (including the presence of weakness and motor deficits), coordination, agility, and stamina. As a result of their strong neuroprotective properties and superior Blood-Brain Barrier (BBB) penetration, kaempferol and quercetin have been shown to bind to all of the chosen targets. While their BBB penetration is significantly lower than that of quercetin and kaempferol, fisetin, rhamnose, and gallic acid may also function as potential anti-neurodegenerative drugs due to their ability to bind to many sites with good binding energy. Moreover, KEGG research indicates that Rhus Tox could be influencing the EGFR, serotonergic, and dopaminergic signalling pathways. These expectations have been confirmed by docking experiments, as the majority of the elements exhibited strong binding affinities with EGFR, SNCA, and MAO-B. These results suggest that more research focusing on these pathways and phytoconstituents in

Table 4. Market preparation of Homeopathy in neurodegenerative disorder

Sr.No.	Brand Name	Content	Dosage	Uses
1	*Gelsemium*	*Gelsemium sempervirens*	30C, 3 times daily	Reduces anxiety, supports cognitive function
2	Phosphorus	Phosphorus	30C, 3 times daily	Enhances memory, reduces anxiety
3	*Nux vomica*	*Strychnos nux-vomica*	30C, 3 times daily	Supports cognitive function, reduces stress
4	*Belladonna*	*Atropa belladonna*	30C, 3 times daily	Reduces anxiety, supports overall brain health
5	*Hyoscyamus niger*	*Hyoscyamus niger*	30C, 3 times daily	Enhances cognitive function, reduces anxiety
6	*Mercurius solubilis*	Mercuric chloride	30C, 3 times daily	Supports cognitive function, reduces oxidative stress
7	*Lycopodium clavatum*	*Lycopodium clavatum*	30C, 3 times daily	Enhances memory, supports mental clarity
8	*Anacardium orientale*	*Anacardium orientale*	30C, 3 times daily	Reduces anxiety, supports cognitive function
9	*Stramonium*	*Datura stramonium*	30C, 3 times daily	Supports cognitive function, reduces stress
10	*Thuja occidentalis*	*Thuja occidentalis*	30C, 3 times daily	Enhances cognitive function, supports overall brain health
11	*Aconitum napellus*	*Aconitum napellus*	30C, 3 times daily	Reduces anxiety, supports cognitive function
12	Zincum Metallicum	Zinc	30C, 3 times daily	Enhances cognitive function, supports overall brain health
13	*Ignatia amara*	*Ignatia amara*	30C, 3 times daily	Reduces anxiety, supports cognitive function
14	*Natrum Muriaticum*	Sodium chloride	30C, 3 times daily	Enhances memory, reduces anxiety
15	*Argentum nitricum*	Silver nitrate	30C, 3 times daily	Supports cognitive function, reduces stress
16	*Calcarea carbonica*	Calcium carbonate	30C, 3 times daily	Enhances cognitive function, supports overall brain health
17	Phosphoric Acid	Phosphoric acid	30C, 3 times daily	Reduces anxiety, supports cognitive function
18	Sepia	*Sepia officinalis*	30C, 3 times daily	Enhances memory, reduces anxiety
19	*Aurum metallicum*	Gold	30C, 3 times daily	Supports cognitive function, reduces stress
20	*Bryonia alba*	*Bryonia alba*	30C, 3 times daily	Enhances cognitive function, supports overall brain health
21	Lachesis	*Lachesis muta*	30C, 3 times daily	Reduces anxiety, supports cognitive function
22	Opium	*Papaver somniferum*	30C, 3 times daily	Enhances cognitive function, supports overall brain health
23	Platina	Platinum	30C, 3 times daily	Reduces anxiety, supports cognitive function
24	Carcinosin	Carcinosinum	30C, 3 times daily	Enhances memory, reduces anxiety
25	Medorrhinum	Medorrhinum	30C, 3 times daily	Supports cognitive function, reduces stress
26	*Hypericum perforatum*	*Hypericum perforatum*	30C, 3 times daily	Antidepressant, anti-inflammatory
27	*Lycopodium serratum*	*Lycopodium serratum*	30C, 3 times daily	Cognitive enhancer, supports brain health
28	*Polygala tenuifolia*	*Polygala tenuifolia*	30C, 3 times daily	Enhances memory, reduces cognitive decline
29	*Cyperus rotundus*	*Cyperus rotundus*	30C, 3 times daily	Anti-inflammatory, supports cognitive function
30	*Prunella vulgaris*	*Prunella vulgaris*	30C, 3 times daily	Anti-inflammatory, supports brain health
31	*Melissa officinalis*	*Melissa officinalis*	30C, 3 times daily	Reduces anxiety, supports cognitive function
32	*Morinda citrifolia*	*Morinda citrifolia*	30C, 3 times daily	Supports overall brain health, cognitive enhancer
33	Phosphorus	Phosphorus	30C, 3 times daily	Enhances memory, reduces anxiety
34	*Gelsemium*	*Gelsemium sempervirens*	30C, 3 times daily	Reduces anxiety, supports cognitive function
35	Zincum Metallicum	Zinc	30C, 3 times daily	Enhances cognitive function, supports overall brain health

in vitro and *in vivo* models is necessary to determine their effectiveness, which might eventually result in improved neurodegenerative disease treatment choices.

Apart from these pharmaceutical methods, trace elements are also acknowledged for their significance in treating neurodegenerative diseases. About thirty elements are necessary for the physical structure of the human body, and zinc is one of them. Psoric disorders, which primarily affect the neurological and emotional levels, can be attributed to either a quantitative or qualitative lack of these components. Zincum metallicum, a homoeopathic medication made by triturating the metal itself, is one example. Zincum metallicum may be a useful medication for Parkinson's disease prophylaxis, as evidenced by research on a rat model that showed it to be effective in slowing down neuronal damage in Parkinsonism. In this study, the lesion group dramatically reduced behavioural activities, including locomotor activity, distance travelled, and stereotyped movements, while increasing rest time. These behavioural activities were the main outcome measures (Table 4). According to a reportorial investigation that mostly consulted the clinical repertory, zinc metallicum is one of the top four medications used for Parkinson's disease[89].

3. Future Aspects

The future of *AYUSH* (*Ayurveda*, *Yoga* and *Naturopathy*, *Unani*, *Siddha*, and *Homoeopathy*) in the care of neurodegenerative disorders relies on evidence-based integration with contemporary medical research. A multidisciplinary strategy that integrates conventional and modern therapy paradigms may provide innovative solutions for neuroprotection, disease modification, and symptom relief. Comprehensive pharmacognostic investigations on Ayurvedic formulations, including *Withania somnifera*, *Bacopa monnieri*, and *Curcuma longa*, may be undertaken to isolate and characterise bioactive components. Mechanistic investigations and nanotechnology-based delivery systems may be created to enhance bioavailability and facilitate penetration of the blood-brain barrier. The clinical validation and standardisation of herbal medicines are essential for *AYUSH*-based treatments. Incorporating *AYUSH* into neurorehabilitation and lifestyle alterations, including *Yoga* and neuroplasticity, may alleviate oxidative stress and neuroinflammation. Innovative drug delivery methods, including nasal and transdermal applications, may improve patient adherence and therapeutic results. Artificial intelligence and computational methods may facilitate the prediction of bioactive interactions between herbal substances and targets linked with neurodegenerative diseases. Policy implications and international cooperation among *AYUSH* institutes, pharmaceutical industries, and academic research centres are crucial for the advancement of proven herbal treatments.

4. Conclusion

The incorporation of *AYUSH* practices into the management of neurodegenerative illnesses provides a hopeful improvement in healthcare, particularly in addressing the limits of traditional medicines. Neurodegenerative disorders such as Alzheimer's, Parkinson's, and ALS are characterised by progressive neuronal loss, oxidative stress, and metabolic dysfunction, all of which lead to cognitive and motor deficits. Despite substantial studies, effective disease-modifying medicines remain elusive in modern medicine. The comprehensive approach of *AYUSH* systems – *Ayurveda*, *Yoga*, *Naturopathy*, *Unani*, *Siddha*, and *Homoeopathy* – offers a complementary perspective that focuses on disease prevention, lifestyle adjustments, and natural therapies.

Ayurveda, with its tailored treatment regimens, stresses neuroprotection through herbal formulations, dietary changes, and therapeutic methods like Nasya (intranasal drug delivery), which offers a fresh pathway for bridging the blood-brain barrier. Herbs such as *Ashwagandha* (*Withania somnifera*), *Brahmi* (*Bacopa monnieri*), and *Curcumin* (*Curcuma longa*) have exhibited neuroprotective, anti-inflammatory, and antioxidant activities in both preclinical and clinical research, making them viable adjuncts to conventional medications. Similarly, *Yoga* and meditation have proven efficacy in lowering stress-related neurotoxicity and enhancing cognitive resilience, while *Unani* and *Siddha* treatments add herbal and mineral-based formulations with potential neuroactive effects.

From a pharmaceutical research standpoint, future developments should focus on standardising herbal

formulations, enhancing bioavailability, and conducting rigorous clinical studies to provide scientific validation. The pharmacokinetics and pharmacodynamics of plant-derived bioactive chemicals must be further investigated to assure their efficacy and safety. Additionally, new drug delivery techniques, such as nano-formulations of herbal extracts, could enhance their therapeutic potential and enable targeted medication delivery to the central nervous system.

As the prevalence of neurodegenerative illnesses continues to rise, merging *AYUSH* techniques with modern medicine could bridge the gap between symptomatic treatment and disease modification. However, establishing this synergy requires overcoming hurdles such as regulatory standardisation, quality control, and evidence-based validation of traditional formulations. Collaborative efforts between pharmaceutical researchers, neuroscientists, and *AYUSH* practitioners will be important in creating future treatment paradigms. By taking an integrative approach, the healthcare system may harness the assets of both traditional and contemporary medicine to improve patient outcomes and advance the fight against neurodegenerative diseases.

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5. Author Contribution

KAP and DSN: data analysis, figure preparation, and manuscript writing. NB: data analysis, supervision, review, and editing. MSB and NB: supervision, review, and editing. NB; HKP: supervision, data discussion, interpretation, critical manuscript revision and editing, project administration, and funding acquisition. NB and BVD: review and editing. All the authors have read and approved the final version of the manuscript.

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