Indian Herbal Medicine Use for Treatment of Dementia

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***Abstract*—Alzheimer's disease (AD) is a chronic neurodegenerative disorder affecting 10million people worldwide. It causes brain cell damage, leading to memory, thinking, and behavior issues. Factors contributing to AD include acetylcholine deficiency, free radicals, and brain tissue inflammation. Studies suggest that natural components, such as medicinal plants and phytoconstituents, could be effective dementia treatments with fewer side effects. Herbal treatments, such as Indian herbal remedies like Centella asiatica, Bacopa monnieri, Curcuma longa, Withania somnifera, Ginkgo biloba, and Melissa officinali, are becoming more popular due to their effectiveness, safety, and affordability. Over 100 novel products are currently in clinical development, with medicinal plants being the most effective source of leads for medication development. Ginseng's cognitive-enhancing properties and mechanisms of its positive effects are also discussed. Alternative medicine, such as ayurveda, is becoming increasingly popular for its health-promoting properties and its potential in treating cognitive impairments in the elderly.**

***Index Terms*—Alzheimers disease, Meta-analysis, Mini mental state, Active constituent**

I. INTRODUCTION

Alzheimer's disease (AD) is a neurological illness that progresses over time. It is the primary cause of anxiety, sedation, and dementia. representing roughly 60% to 70% of the cases. In East Asian nations, herbal therapy has long been utilized to relieve cognitive impairment and alleviate dementia symptoms..Furthermore, plants and herbs are known to be humanity's oldest plants. Herbs have been utilized as food and medicine for millennia. Herbs have a variety of actions, including antiamyloid, neuromodulatory, anti-inflammatory, antiapoptotic, and antioxidant qualities, according to earlier research. This disorder affects several neurological disorders and is defined by a progressive loss of motor and sensory neurons as well as the mind's capacity to link sensory information to an external object. Cognitive functions that are mainly affected in AD patients include memory, executive functioning,language, visuospatial functioning and attention. Several hypotheses have been proposed for establishing the cause of AD. Cholinergic hypothesis, which is the oldest theory, describes acetylcholine (ACh) deficiency as the causative factor This shows a clear correlation between the ethnomedical used of the plants and current used of their derived drugs. A substantial amount of money has been put into the study and development of AD treatments over the last three decades. As of right now, there areno Food and Drug Administration- (FDA-) approved treatments for the condition. The deposition of Aβ, a peptide that varies in size from 39 to 43 amino acids, in the senile plaques in the AD brain is believed to be the crucial step in AD pathogenesis (amyloid cascade hypothesis). Wide fluctuations in attentiveness and concentration are frequently the first signs of dementia with Lewy bodies. People who have this disorder frequently have similar tremors and muscle rigidity, as well as visual hallucinations.The majority of research on these herbs supports their numerous pharmacological qualities, including their anti-inflammatory, antioxidant, anti-apoptotic, and antimitotic effects. This narrative evaluation is based on substances found in the mentioned herbs that, following a thorough selection, were identified as some of the most promising for AD medication therapy. identified as having Parkinson's disease. Another uncommon condition that can occasionally be challenging to differentiate from Alzheimer's is frontotemporal dementia, also known as Pick's disease. Disorientation and personality changes frequently precede memory loss. According to the findings, Chinese herbal medicine holds promise for treating AD in the future. Regretfully, the majority of clinically tested Chinese herbal medicines are herbal formulations rather than individual herbs.Ischemia brought on by the impaired cerebrovascular circulation damages the structure of the brain, resulting in silent brain infarctions or the development of white matter lesions. Western medication or a placebo served as the

control intervention. Excluded from consideration were studies that combined Chinese herbal medicine with western medication or other types of treatment. Chinese herbal therapy has been used extensively to treat dementia and cognitive impairment in elderly patients throughout eastern Asia. Apathy (a diminished interest in other people), emotional changes (such as being easily agitated), and behavioral abnormalities (such as repeating inquiries or leaving the house without warning) are common signs of AD in addition to cognitive impairment. Apathy (a diminished interest in other people), emotional changes (such as becoming easily agitated), and behavioral abnormalities (such as repeating inquiries or leaving the house without warning) are common signs of AD in addition to cognitive impairment. Dementia is therefore regarded as the biggest worldwide health and social care concern of the twenty-first century.Environmental factors are thought to play a significant role in AD development, even though hereditary factors may enhance a person's risk. Clinically substantial improvement was observed in all but one of 40 controlled trials involving ginkgo extracts in the treatment of dementia improvement in mood depression, anxiety, exhaustion, memory loss, and focus. The most prevalent type of dementia is Alzheimer's. According to specialists, this combination is also highly prevalent. Evidence suggests that this kind of dementia is far more prevalent than previously thought. Self-reported memory issues frequently accompany memory loss. Although it is not a typical early symptom of dementia, difficulty remembering names that are recalled later is prevalent in aging.Performance below normal on objective neuropsychological cognition tests combined with preserved everyday activities (e.g., the ability to function) is known as mild cognitive impairment (MCI). within society such as for daily activities at work.Herbal remedies have been utilized to treat neurological disorders since ancient times. Eighty percent of the world's population uses traditional medicine, or medicinal herbs, for overall health, according to a research by the World Health Organization (WHO). Herbal medication is the primary line of treatment for 60% of children with high fevers caused by malaria in nations including Ghana, Mali, Zambia, and Nigeria. In Middle Eastern nations like Jordan, the use of herbal remedies is common and advised for overall health India’s medical history dates back thousands of years. Written between 4500 and 1600 B.C., the Rigveda is arguably the oldest collection of human knowledge and contains the earliest references to the usage of plants for medical purposes. Prescriptions are also included in the Atharvaveda. of herbs for a range of conditions. Later, a major component of Ayurveda would be the use of herbs to treat illnesses.The conceptual framework for corrective actions is provided by academic research on Alzheimer's disease. implies that the deposition of β-amyloid, which eventually results in senile plaques, neurofibrillary tangles, neuronal cell death, and dementia, is the initial pathogenic event in AD. The management of AD is believed to be complex because no particular medicine has been found to control its symptoms. The majority of AD treatments concentrate on treating behavioral and neurological problems, which can get worse as the disease progresses. Alternative techniques to treating AD should be investigated due to the current medical system's low patient compliance, side effects, and limited efficacy. Often, this procedure cannot be reversed. This condition affects the vision, speech, memory, behavior, and cognition of the brain. Notably, Alzheimer's disease accounts for almost 70% of dementia cases in the US, making it the leading cause of the condition. A proper diagnosis of each type of dementia is necessary for the best possible treatment. In clinical practice, it can be challenging to distinguish between these conditions.Herbal remedies, medication, and rehabilitation are all part of the treatment. Centella asiatica (L.) and Bacopa monnieri (L.) Wettst. have been used in medicine because of their bacoside and triterpenoid saponin, which help older people remember things better. The primary features of this illness include challenges with daily domestic tasks causing emotional and cognitive dysfunction in older adults. AD treatment is clinically challenging. Good prospects for managing AD symptoms have surfaced with the introduction of cholinesterase inhibitors and an N-methyl-d-aspartate antagonist (memantine). Furthermore, most patients are considered irregular, suggesting that combinatorial dysregulation of transcriptional, post-transcriptional processing, epigenetic, and translational control of RNA transcripts, as well as the cumulative effect of many non-pathogenic variations in the patients' genes, may play a significant role in the secondary molecular pathology of AD. Thus, any of the aforementioned

illnesses may be the cause of AD. Most people have an uncommon form of AD known as early-onset AD, which is genetic and thought to impact less than 1% of cases. genetic in nature. Herbal remedies in the form of Ayurvedic drugs are still widely available and well-liked by the general public, thanks to the persistent efforts of India's herbal companies, especially Patanjali, Dabur, Zandu, Baidyanath, Himalaya, etc. The manufacturing and distribution of medications derived from medicinal plants has seen a recent surge, and their commercial and scientific value appears to be gaining traction in fields related to health. These plant-derived products are meticulously standardized, and it has been proven that they are safe and effective for a specific use .The most recent scientific findings about the potential of several medicinal plants in the treatment of AD will be the main topic of this study. AD affects the quality of life for both patients and caretakers. Positive or negative Behavior improvements are a key factor in assessing Alzheimer's patients' quality of life. There is hope for treating AD and dementias with a variety of herbal medicines that have been explored. These herbs are also inexpensive and widely accessible. The results of the herbal medicine treatment are also encouraging, with less adverse effects.

II. LITERATURE REVIEW

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- Medicinal plants for Alzheimer’s disease: updated review Amjad Hasan Bazzari and Firas Hasan Bazzari
- Ayurvedic approach with a prospective to treat and prevent Alzheimers and other cognitive disease: A review Kinjal C Patel, Soma Pramanik, Vibha C Patil

Aim: - The main goals of treating dementia using herbal medicine are to improve cognitive abilities, lower inflammation, and combat oxidative stress. Because of their neuroprotective qualities, herbal treatments like ashwagandha, brahmi, gotu kola, ginger, turmeric, ginseng, and sage are highly valued. These herbs are used to treat dementia symptoms, enhance general brain function, and may be reduce the disease's progression.

A. objective

1.Cognitive Enhancement: Boost general cognitive abilities such as memory and concentration.

2. Neuroprotection: Guard against inflammation and oxidative stress-induced degeneration and damage to brain cells.

3. Symptom Management: Reduce symptoms that are frequently linked to dementia, such as anxiety, sadness, and sleep difficulties.

4. Quality of Life: Improve patients' general quality of life so they can function and be more well on a daily basis.

5. Disease Progression: By focusing on underlying mechanisms such amyloid plaque development and neuroinflammation, it may be possible to limit the disease's progression.

B. Plan of work

Lecanemab is supplied as an intravenous (IV) injection and is sold under the brand name Leqembi. The suggested dosage is an IV infusion of 10 mg/kg given once every two weeks.

1. Active ingredient: lecanemab

Function: Lecanemab is a monoclonal antibody that targets amyloid-beta protofibrils, which are protein

clumps associated with the pathogenesis of Alzheimer's disease. By binding to these protofibrils, lecanemab aids in their removal from the brain, perhaps delaying the onset of cognitive decline.

Formulation type: solution for IV infusion

Delivery Method: It is specifically designed for IV administration, allowing direct delivery to the bloodstream.

2. Advantages of IV Formulation

With this method of administration, the medication can be consistently and swiftly given to the brain. Lecanemab's capacity to act on amyloid-beta protofibrils is improved by the efficient circulation made achievable by the infusion approach.

3. Excipient and stabilizers

Polysorbate 80: Olysorbate 80 is a common stabilizer used in monoclonal antibody compositions. It prevents the lecanemab protein from clumping together or breaking down during storage and infusion.

Sodium Chloride (NaCl): Lecanemab is typically diluted with a 0.9% sodium chloride solution before infusion. This solution lowers the risk of adverse responses during administration by regulating the volume and ensuring isotonicity with the blood.

4. PH and buffering agent

Buffering Agents: To maintain the pH at the optimal level for stability, the solution may contain buffers such as sodium phosphate or histidine. These reduce the possibility that the stability of the monoclonal antibody will be impacted by pH changes.

Target pH Range: The solution is made to a slightly acidic or neutral pH (about 5-7) to make it stable for protein-based drugs and generally suitable for human infusion.

5. Dilution and administration guideline

The lecanemab-containing vial is diluted with a 0.9% sodium chloride solution (normal saline) before being delivered. The exact dosage, 10 mg per kg, depends on the patient's body weight.

Infusion Time: It typically takes an hour or so to complete the IV infusion process. This allows the medication to be administered gradually, reducing the possibility of infusion-related reactions.

6. Storage Conditions

Temperature: Lecanemab is normally stored in a refrigerator between 2°C and 8°C (36°F and 46°F) to maintain its stability.

Light Sensitivity: To stop the monoclonal antibody from deteriorating, the drug is kept in a dark or light-protective container.

Shelf Life: The formulation has a limited shelf life after being diluted for infusion, but it stays stable in the refrigerator.

C. Sign and symptoms

- Reduces the ability to learn.
- Loss of reason, retain, or recall of experience.
- Loss of patterns of thoughts, feelings, and activities.
- Additional mental and behavioral problems.
- Behavior may be disorganized, restless or inappropriate.
- Some people become restless or wonder about by day and sometimes at night.
- There may be a sudden change to tears or anger („‟a catastrophic reaction‟‟‟). their
- Suffers to deny that relatives, even relatives in immediate family, are their relatives.
- Depression affects 20-30% of people who have dementia, about 20% have anxiety.
- Cognitive dysfunction of shorter duration is called “delirium.”

D. Types of dementia

1. vascular dementia: due to decreased blood supply to the brain Vascular dementia (VaD) is a serious global health concern and the second most common form of dementia. A thorough analysis of VaD is needed to improve practitioner comprehension and direction. We offer a recent summary of the pathophysiological underpinnings, neuroaging trends, epidemiology, and current therapeutic and diagnostic strategies. Method and materials.vascular dementia are high blood pressure (hypertension), irregular heart rhythms (arrhythmias) and diseases which cause damage to the arteries in the brain. The prevalence of the illness is 1.5% in western countries and approximately 2.2% in Japan. It accounts for 50% of all dementias in Japan, 20–40% in Europe and 15% in Latin America

Causes:

1 stroke: - A major cause is stroke where blood vessel in the brain become blocked or bursts.

2. Other causes: - condition like high blood pressure,Diabetes and atherosclerosis.

symptoms

1. Mood changes: - depression, apathy,and emotional instability

2.Cognitive decline: - problems with memory, thinking attention and reasoning

E. Lewy body dementia: - associated with abnormal protein deposit called lewy body in the brain. These deposits affect brain regions involved in thinking, memory, and movement. which constitutes 15% of all dementia cases (Zaccai et al., 2005). Within DLB, the loss of cholinergic (ACh-producing) neurons is thought to account for the degradation of cognitive functioning, as in AD, while the loss of dopaminergic (dopamine-producing) neurons is thought to account for the degradation of motor control, as in PD (Heidebrink, 2002). It is characterized anatomically by the presence of Lewy bodies,

Causes:

1.insomnia

2.constipation

3. visual hallucination

Symptoms:

1. Cognitive Issues: Memory loss, confusion, and difficulty concentrating

2. Movement Problems: Rigid muscles, slow movement, tremors, and a shuffling walk

3. Visual Hallucinations: Seeing things that aren't there

4.Behavioral Changes: Mood swings, depression, and anxiety

5. Sleep Issues: Difficulty sleeping and acting out dreams

F. Frontotemporal dementia

Frontotemporal dementia (FTD) is a group of brain disorders that primarily affect the frontal and temporal lobes of the brain, which are responsible for personality, behavior, and language

Causes:

1. Lack of empathy

2. Poor judgment

3. Apathy

4. Repetitive compulsive behavior

5. Poor personal hygiene

Symptoms:

1. Behavioral Changes: In appropriate actions, lack of empathy, poor judgment, apathy, repetitive compulsive behavior, poor personal hygiene, and overeating

2.Speech and Language Problems: Impairment or loss of speech, language difficulties

3. Movement Disorders: Tremor, rigidity, muscle spasms, poor coordination, difficulty swallowing, and muscle weakness

G. Herbal medicine used to treat dementia :-

1. Baccopa monnieri :-

SYynonyms : Indian pennywort, Gratiola monnieria, Bacopa monnieri, Water hyssop,Brahmi.

Family: Scrophulariaceae.

Description :- Water hyssop, also known as Brahmi, thyme-leafed gratiola, or Baccopa monnieri, is a perennial creeping herb that grows in muddy shorelines and marshes.It is a member of the Scrophulariaceae family and can grow up to 1,500 meters in marshes . Bacosides A and B are the components that give bacopa its cognitive effects. Bacopa's capacity to improve nerve impulse transmission is due to its triterpenoid saponins and its bacosides . Brahmi may have neuroprotective and memory-enhancing effects through a variety of pathways, including an increase in antioxidant activity . Gotu kola water extracts are utilized in the Ayurvedic medical system to promote healthy sleep in addition to reviving and repairing neural cells.

Biological source :- It is made up of the stems and leaves of the Bacopa monniera L. plant, which is a member of the Scrophulariaceae family.

Chemical constituent :- Bacosides, which are triterpenoid saponins, are the primary chemical constituents of B. monniera. This plant has also been found to contain the alkaloids herpestine, nicotine, and brahmine. Additionally, new saponins known as bacopasides I–XII have been discovered Bacosides A, B, and C.

Mechanism of action :-

Microglia activation, which is triggered by neural injuries, can produce an excess of superoxide radicals.48 Therefore, a key source of reactive oxygen species (ROS) generation is mitochondrial autophagy.49 Since mitochondria are both the source and the target of toxic ROS, it is thought that ROS generation, the activation of mitochondrial permeability transition excitotoxicity, reduced adenosine triphosphate production, and altered calcium homeostasis are the mechanisms through which mitochondrial dysfunction causes neuron degeneration in AD.

Uses :-Antioxidant, improve memory capacity, improve cognitive ability, inhibiting lipoxygenase activity.

H. Centella asitica :-

Synonyms :- Hydrocotyle asiatica, Mandukaparni, Kodangal.

Family :- Umbelliferae.

Description :- It has been shown to have neuroprotective qualities. Tropical swamps are the ideal growing conditions for Centella asiatica. The green to reddish-green stolons that connect plants are thin and creeping. It has smooth, long-stalked, reniform, green leaves with rounded tips and veins that are palely netted. Due to the presence of the triterpenoid brahminoside, an alcoholic extract of the plant exhibited cholinomimatic and maybe traqulizing properties in vivo. A transgenic animal model was used in a recent study to assess the effectiveness of Centella asiatica extract.

Biological source :- centella asiatica is derived from the aerial parts of the plant.

Chemical constituent :- Numerous triterpenic acid types, such as Madasiatic acid, Madecassic acid, Thankunic acid, Indocentoic acid, Euscaphic acid, Terminolic Isothankunic acid, and Asiatica acid, are found in gotu kola.Asiatic acid (AA), madecassoside acid (MA), asiaticoside, and madecassic acid are pentacyclic triterpenoids that, in addition to scentellin, asiaticin, and centillicin, purify the blood, improve memory, increase learning capacity, encourage longevity, and lower high blood pressure.

Mecganism of action :-

Extracts from Centella asiatica decreased oxidative stress and β-amyloid levels, prevented neuronal processes from shrinking, and shielded against damage linked to β-amyloid and behavioral impairments in Alzheimer's disease. Centella asiatica treatment restored mitochondrial deficiencies, enhanced antioxidant defense, decreased cell death markers, and markedly improved memory function. Asiatic acid has been the most extensively researched of Centella asiatica's many constituents in preclinical settings. Asiatic acid has neuroprotective and antioxidant properties and does cross the blood-brain barrier. potential use of gotu kola in the management and avoidance of beta-amyloid toxicity and AD.

Uses :- 1. The effect of Centella asiatica extract and powder in reducing oxidative stress in rats wasevaluated in another study.

2. This plant is used in nervous, blood and skin diseases.

3. Plant is antiseptic, diuretic, use in leprosy, psoriasis, syphilitic ulcer, fever,dysentery, Rheumatism and bowel complaints.Leaves are tonic, rich in ascorbic acid; accelerate nervous activity, good for increasing memory

I. Ginkgo biloba:-

Synonyms :- Maidenhair,kew tree, salisburia.

Family :- Ginkgoaceae

Description :-

Ginkgo biloba is a natural cure that has been used for thousands of years in traditional Chinese medicine to treat a variety of ailments. It promotes blood flow to the brain and other tissues and speeds up cellular metabolica Clinical studies have demonstrated that by reducing mitochondrial dysfunction, gingko leaf extract enhances cognitive function in older adults without dementia, AD patients, and those with vascular dementia. This lends credence to the mitochondrial cascade theory of dementia Ginkgo biloba's anti-inflammatory and antioxidant properties are thought to protect cell membranes and regulate neurotransmitter function.

Biological source :- It consists of leaves obtained from plant Ginkgo biloba L., belonging to family Ginkgoaceae**.**

Chemical constituent :- The chemically determined nutritional and bioactive components of G. biloba include fatty acids, sugars, organic acids, tocopherols, phenolics, and flavonoids. Palmitic, α-linolenic, and oleic acids were the most common fatty acids; fructose was the most common sugar; quinic acid was the most common organic acid; and α-tocopherol was by far the most common vitamin.

Mechanism of action :- Numerous central neurotransmitter systems, including as the monoaminergic, GABAergic, and cholinergic systems, are modulated by ginkgo, according to research on its possible mechanisms of action. In older rats, ginkgo has been demonstrated to reverse the decline in 5-hydroxy tryptophan 1A (5-HT1A) and nurodegenric receptors . Platelet-activating factor receptors become alienated, nitric oxide production rises, and red cell accumulation decreases.

Uses:- 1**.** This ancient tree has been profusely used in Chinese, Japanese and Indonesian traditional medicine

2. Ginkgo biloba is now the most commonly sold herbal product in Germany and one of the top three herbals in the United States,

3. An extract of Gingko biloba has been found in several studies to improve the symptoms and slow the progression of Alzheimer's disease

J. Melissa officinalis (Lemon balm)

SYNONYMS :- Balm mint , Garden balm

Family :- Lamiaceae

Description:- It was believed that Mellisa officinalis and Melissa officinalis enhanced memory. Melissa officinalis has been shown to improve cognitive function and reduce agitation in patients with mild to moderate AD. In European traditional medicine, lemon balm (M. officinalis), a perennial herb native to the eastern Mediterranean and West Asia, has been used to improve memory.A double-blind, randomized, placebo-controlled study was conducted to evaluate the therapeutic potential of M. officinalis extract in those with mild to moderate AD.

Biological source: - Mellisa officinalis is the leaves of the lemon balm plant. This plant belongs to the family Lamiaceae (mint family).

Chemical constituent :- The leaves of Melissa officinalia contain essential oils (citral), monoterpenoid aldehyde, monoterpene glycosides, triterpenes (ursolic and oleanolic acids), sesquiterpenes, tannins, polyphenolic compounds

(rosmarinic acid, caffeic acid, and protocatechuic acid), and flavonoids (quercitrin, rhamnocitrin, and luteolin).oil.Its antioxidant impact has been attributed to the presence of monoterpenes and sesquiterpene hydrocarbons, which have been demonstrated to have a modest AChE inhibitory effect.The most effective part can be used to identify cis- and trans-rosmarinic acid (IUPAC name: cholinesterase inhibition). (2"R")-2-[[(2"E")[Dihydroxyphenyl-2-propenyl-1-oxo-2-(3, 4-)]] [oxy]Derivative of rosmarinic acid and -3-(3, 4-dihydroxyphenyl) are active components. Isomers of propanoic acid

Mechanism of action: -

Utilized for over 2,000 years, this ancient medicinal plant is widely renowned for boosting memory and prolonging life. The leaves of this plant contain (i) phenol carboxylic acids, like rosmarinic acid, which has antioxidative, anti-amyloidogenic, and antiapoptotic qualities, and (ii) monoterpenes, like citral, that have modest anti-AChEs action.This feature was examined in vitro by inhibiting GABA-T and Monoamine Oxidase A (MAO-A) in SH-SY5Y cells exposed to hydrogen peroxide (H2O2) using a novel standardized phospholipid carrier-based (Phytosome™) MO extract.

Uses: - Cognitive improvement, mood enhancement, sleep quality improvement. (Melissa officinalisis one of several plants that may be useful in the prevention and treatment of Alzheimer's disease due to its ability to inhibit acetylcholinesterase and its antioxidant activity.

K. Salvia officinalis (Lamiaceae)

Synonyms: - common sage, Garden sage, Golden sage

Family: - Mint family (Lamiaceae)

Description: - Many people think that the plant sage that has a reputation for boosting intellect in traditional and folkloric medicine as well as in Europe is S. officinalis, a perennial shrub that is native to the Mediterranean region. Anti-dementia, anti-inflammatory, antioxidant, and antinociceptive properties have also been demonstrated. Due to its known mood/cognitive abilities and possible cholinergic effects, sage extract has been utilized in clinical trials for mild to moderate cases of AD.

Biological source: - S. officinalis also known as sage is a perennial or annual bushy plant that is native to the mediterranean region.

Chemical constituent: - Alkaloids, carbohydrates, fatty acids, glycosidic derivatives (such as cardiac glycosides, flavonoid glycosides, and saponins), phenolic compounds (such as coumarins, flavonoids, and tannins), polyacetylenes, steroids, terpenes/terpenoids (such as monoterpenoids, diterpenoids, triterpenoids, and sesquiterpenoids), and waxes are among the many constituents of S. officinalis.

Mechanism of action: -

These include polyacetylenes, steroids, terpenes/terpenoids (monoterpenoids, diterpenoids, triterpenoids, and sesquiterpenoids), alkaloids, It is more commonly referred for Alzheimer's disease treatment. It has been reported to assist the brain in the fight against AD. Sage contains the antioxidants carnosic acid and rosmarinic acid. These compounds are thought to protect the brain from oxidative damage.

Uses: - 1.use as an insomnia, dizziness headache and palpitation

2. Treating muscle pain

3. reducing inflammation: sage has anti-inflamatory property.

Treatment: -

Therapies for AD try to manage symptoms and reduce the disease's progression because there is presently no recognized cure. Treatment plans include both pharmaceutical and non-pharmacological therapies. Memantine, an NMDA receptor antagonist, is approved for moderate to severe AD.

Memantine regulates glutamatergic activity by blocking NMDA (N-methyl-D-aspartate receptor) receptors, which are implicated in memory and synaptic plasticity. To provide further benefits,

cholinesterase inhibitors are commonly used in combination with this medicine.

III. DRUG USED TO TREAT DEMENTIA WHICH CAUSE LOW SEDATION

A. Lecanemab (Leqembi): -

1. FDA approval: -

Clinical trials have evaluated lecanemab, which has demonstrated potential in lowering the accumulation of amyloid plaque, a defining feature of Alzheimer's disease.

The U.S. Food and Drug Administration (FDA) fully approved it in July 2023, positioning it as one of the few medicines for Alzheimer's that alters the illness rather than merely treating its symptoms.

It is designed for patients with mild cognitive impairment or mild dementia who are in the early stages of Alzheimer's disease.

Potential side effects of lecanemab include the possibility of brain hemorrhage or edema, especially in patients with specific genetic markers such as APOE4.Consequently, the medication needs to be closely watched.

A monoclonal antibody called lecanemab is intended to target and remove amloyd beta plaque, which is linked to Alzheimer's disease. It was created by Eisen and Biogen as a therapy to help patients with early-stage Alzheimer's disease slow down their cognitive loss.The medication functions by attaching itself to both soluble and insoluble forms of amloyd beta.

B. Mechanism of action: -

Target: - Lecanemab specifically targets amyloid-beta (Aβ) plaques in the brain. These plaques are aggregates of amyloid-beta proteins, which are believed to contribute to the neurodegenerative process in Alzheimer’s disease.

Action: - By binding to these plaques, lecanemab facilitates their clearance from the brain, potentially slowing the progression of the disease.

C. Clinical use: -

1. Administration: - The drug is administread via intravenous infusion,typically every two weeks.

2. Indication: - lecanemab is indicated for patients with early alzheimers disease including mild cognitive impairement or mild dementia stages

IV. OBJECTIVE

Various neuropsychiatric manifestations in dementia patients were studied. The study's goals were to review, re-analyze, and re-interpret the clinical trial, to show how effective a Bayesian design is, and to show how it can accommodate treatment-dependent types of missing data as well as innovations in the prospective design

A. Side effect: -

1. Headache: - some patient report experiencing headache.

2 Nausea: - feeling sick to the stomach in another reported side effect.

3. Diarrhea: - some patient may experience gastrointestinal issues.

4. Infusion related reaction: - these can include fever, child and rash

Beta amloyd: - is a protein fragement that is produced from a larger protein called beta amloyd precursor the accumulation of beta-amyloid plaques is believed to play a key role in the development and progression of Alzheimer's disease by disrupting cell function and triggering inflammation

Plaques: - Plaques are clumps of protein fragments, like beta-amyloid, that accumulate between the nerve cells (neurons) in the brain. In Alzheimer's disease, these plaques are toxic to neurons, disrupting their function and ultimately leading to cell death.

B. Application: -

1. Diminishes Amyloid Plaques: Lecanemab targets and diminishes brain amyloid beta plaques, which are linked to the advancement of Alzheimer's disease.

2. Reduces Cognitive Decline: Lecanemab has been demonstrated in clinical trials to reduce cognitive and functional decline in patients with early-stage Alzheimer's disease

3.The FDA granted lecanemab accelerated approval based on its ability to remove amyloid plaques, making it available to patients sooner.

4. Potential for Early Intervention: Lecanemab is intended for patients with mild cognitive impairment or mild dementia, allowing for earlier intervention in the disease process.

5. Enhances Quality of Life: By slowing cognitive decline, lecanemab can help patients maintain their recognition, memories, and mental sharpness for longer periods of time, allowing them to participate more fully in daily life

C. Future prospects:

Advancements in understanding AD pathogenesis are guiding the development of novel therapeutic strategies. Research is increasingly focusing on early intervention and prevention, with the goal of delaying or preventing the onset of AD in at-risk individuals.A key area of research is the development of disease-modifying therapies that target the underlying mechanisms of AD. Beta-secretase inhibitors, which reduce Aβ production, and tau aggregation inhibitors, which prevent the formation of neurofibrillary tangles, are currently being investigated in clinical trials.Therefore, it urgently necessitates developing an alternate treatment with minimal side effects, especially from natural resources. It encourages researchers to develop new medicines from natural products, i.e., phytochemical-based therapeutic, which could provide significant clinical benefit in managing dementia patients. Phytochemicals from medicinal plants remain crucial for developing new pharmacological drugs against dementia.

D. Abbreviations: -

BPSD: Behavioral and psychological symptoms of dementia
FTD: Frontotemporal dementia
VD: Vascular Dementia
AB:beta-amloyd
BM: Bacopa monnieri
AChEI: Acetylcholinesterase inhibitor
WHO: World health organization
FDA:Food and drug administration
GBE:Ginkgo biloba
CUR:Curcumin

V. CONCLUSION

The early treatment of dementia and other disorders including memory loss and dementia may benefit from the use of herbs. Their decreased toxicity in comparison to pharmacological medicines is one of their main advantages. Another advantage is that, compared to pharmaceutical medicines, plants exhibit very little interaction with one another. Generally speaking, vegetables and plants strengthen the body's immune system, which lowers the risk of illness development.There isn't a reliable biological treatment for AD or other dementias at the moment. AD is a slow-growing, complex neurological illness. In order to effectively treat and control AD, a variety of pharmacological methods that target anti-inflammatory, antiamyloid, antioxidant, and procholinergic pathways have been investigated in various stages. Since ancient times, alternative medical systems have been in use, and several herbal compositions and extracts of medicinal plants have shown promise in treating AD. The availability of diverse chemical elements and their capacity to operate on a variety of biological targets make medicinal plants a fertile ground for the development of novel drugs. To turn this potential into real medicine, however, a lot of effort needs to be done.There is relatively little clinical data available for many of the plants and chemicals that have shown actions related to AD therapy. Before recommendations about the normal use of active plants and chemicals can be made, more research is needed to determine their clinical usefulness and potential toxicity in larger trials. Nonetheless, attempts should be made to increase our understanding of herbs, and many. It is necessary to do human, long-term research to completely validate the efficacy of this alternative therapy approach. Furthermore, given the rapidly evolving medical profession and the increasing interest of researchers, physicians, and patients, it is possible that AD therapy may primarily consist of supporting or causative therapy that only uses phytotherapy in the future.

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