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PERSON-CENTERED CARE FOR ALZHEIMER'S DISEASE: A REVIEW OF EFFECTIVE STRATEGIES AND INTERVENTIONS

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ABSTRACT:

Alzheimer's disease (AD) is the most prevalent chronic neurological condition. Dementia, another name for AD, is a gradual loss of memory that never fully recovers. It is brought on by the death of healthy brain cells. Ten to fifteen percent of instances of this illness have a hereditary component. But in every case of Alzheimer's disease, the tau protein produces tangles and the beta amyloid (A) protein forms plaques, which interfere with regular neural functions including interacting with other brain cells, delivering nutrition, and transferring neurotransmitters, ultimately resulting in the sickness. This illness destroys brain cells, causing memory loss and cognitive and behavioral problems that are severe enough to disrupt social life, work, or long-held hobbies. The most common cause of Alzheimer's disease in the elderly is dementia. The term "dementia" refers to a group of symptoms that include problems with memory, logic, and social functioning. Cognitive functioning (thinking, remembering, and reasoning) is lost in dementia.

KEYWORDS: Alzheimer's disease, Amyloid β-protein (Aβ), Tau protein, Neuron; Cell therapy,Genetherapy, Neuro-inflammation, Neurofibrillary.

INTRODUCTION

Originally discovered in 1906 by German scientist Alois Alzheimer, it is one of the most prevalent neurodegenerative illnesses in the world. A gradual loss of memory is the hallmark of dementia, the main symptom of the condition. One's ability to think, communicate, and do daily duties declines as the illness progresses1. When he discovered alterations in the brain tissue of a lady who had passed away from a rare mental ailment, Dr. Alois Alzheimer coined the name Alzheimer's disease. Memory loss and language difficulties are among her complaints. When he examined her brain after she passed away, he discovered several variant clumps (now called amyloid plaques) and twisted fiber bundles (now called neurofibrillary, or tau, tangles). However, these plaques and tangles in the brain are also one of the characteristics of Alzheimer's disease. The loss of connections between the brain's neurones is another issue. Neurones carry messages from the brain to the body's muscles and organs as well as between various areas of the brain2.An estimated 4.5 million Americans suffer from AD, and by 2050, the frequency could triple to 13.2 million as the number of aged people rises. 3. Compared to the industrialised world, Asian countries have reported lower incidence rates of AD. 4, 5. Nevertheless, Alzheimer's disease is also characterized by these brain. carry messages from the brain to the body's muscles and organs as well as between various areas of the brain2.An estimated 4.5 million Americans suffer from AD, and by 2050, the frequency could triple to 13.2 million as the number of aged people rises. 3. Compared to the industrialised world, Asian countries have reported lower incidence rates of AD. 4, 5. Age is by far the biggest risk factor; while it is not an inevitable part of aging, the chance of getting the illness rises with age, even if both genetic and environmental factors might influence the possibility of having it. For instance, one in five people between the ages of 85 and 896 and one in fifty people between the ages of 65 and 69 suffer from dementia.Globally, life expectancy is increasing, which places a heavy social and financial burden on people with AD as well as their family members and caregivers.

Short-term memory loss is frequently the first symptom of the illness, and as it worsens, other symptoms include mood swings, disorientation, behavioural disorders (agitation, sleep disturbances, psychosis), and linguistic difficulties. The illness eventually worsens, leading to a loss of physiological function and, eventually, death. The brains of people with AD exhibit two pathological characteristics: intracellular neurofibrillary tangles and extracellular amyloid plaques[7]. B-amyloid peptides (Aβ) produced from amyloid precursor protein (APP) make up the majority of plaques, while tau protein (microtubule associated protein) makes up neurofibrillary tangles. As the condition worsens, so does brain shrinkage brought on by neuronal atrophy. Rare autosomal dominant mutations in three genes APP, PSEN1, and PSEN2 cause familial Alzheimer's disease. Two to three percent of all cases of AD are FAD, and symptoms usually begin earlier, usually in the 30s or 40s. In 1992, Hardy and Higgins postulated that "the causative agent of Alzheimer's disease is the deposition of amyloid beta protein (Aβp) and that this deposition directly leads to neurofibrillary tangles, cell death, vascular damage, and dementia [8].

History:

Alois Alzheimer, a German neurobiologist and psychiatrist, made the discovery of Alzheimer's disease in 1906[9]. It was first discovered in August, a 51-year-old woman. In 1901, her family noticed some surprising behavioural changes in her personality and took her to see Dr. Alois Alzheimer. The family reported issues with abstract thought, memory loss, communication difficulties, poor judgement, and confusion about time and place. Later, Dr. Alzheimer stated that she had behavioural issues, memory loss, trouble with language, and an aggressive form of dementia[10].Numerous other aberrant symptoms were also identified by Dr. Alzheimer, such as abrupt mood swings, personality abnormalities, lack of initiative, extended sleep duration, and disinterest in routine activities[11] before she passed away in 1906, Dr. Alois followed her for almost five years. He conducted an autopsy after his death and discovered atrophied brain cells, fat bodies deposited in blood vessels, and a marked shrinkage of the cerebral cortex [12]. He found senile plaques and neurofibrillary tangles, which are now recognised as signs of AD[13].

Stages of Alzheimer's disease:

There are three general stages in Alzheimer's disease:

- Early stage
- Middle stage
- Late stage (sometimes referred to as mild, moderate and severe in a medical context)

Since Alzheimer's affects people in different ways, each person may experience symptoms or progress through the stages differently.

Early-stage Alzheimer's

At this stage, a person with Alzheimer's may be able to operate independently. He or she is still capable of driving, working, and going to social gatherings. Despite this, the individual may exhibit symptoms of what seems to be memory loss, such as forgetting familiar terminology or the location of everyday things. Friends and family members who are close to the person begin to notice issues. During a comprehensive medical check, doctors may be able to detect memory or concentration problems. Typical difficulties include:

- Trouble remembering names when introduced to new people.
- Challenges performing tasks in social or work settings.
- Forgetting material that was just read.
- Losing or misplacing a valuable object.
- Increasing trouble with planning or organizing.

Middle-stage Alzheimer's

This is often the longest time and might last for several years. As the condition develops, the person with Alzheimer's will require more care. The Alzheimer's patient may start speaking incryptically, show signs of agitation or distress, or engage in unexpected behaviors like skipping showers. It may be challenging to express ideas and carry out daily chores if the brain's nerve cells are damaged.

At this point, symptoms will be noticeable to others and may include:

- Forgetting things that happened or one's own past.
- Feeling irritable or reclusive, particularly in situations that are mentally or socially demanding.
- Having trouble remembering their address, phone number, or the high school or college they attended and graduated from.
- Uncertainty regarding their location or the day.
- The requirement for assistance in selecting appropriate attire for the time of year or event.
  Some people have trouble managing their bowels and bladder.
- Alterations in sleep habits include sleeping during the day and experiencing restlessness at night.
- A higher chance of getting lost and wandering.
- Personality and behavioural changes, such as compulsive, repeated behaviours like tissue shredding or hand wringing, or suspicion and delusion.

Late-stage Alzheimer's

In the last stages of the disease, a person loses the ability to respond to their environment, speak, and finally control their motions. Even though they could still utilize words or phrases, it becomes difficult for them to communicate their sorrow. Deterioration of memory and cognitive ability can lead to significant personality changes and the need for significant help with daily chores.

At this stage, individuals may:

- Require 24-hour support for everyday tasks and personal hygiene.
- They lose awareness of their surroundings and recent events.
- Observe changes in physical capabilities, such as capacity to sit, walk, and finally swallow.
- Have a harder time communicating. Become increasingly vulnerable to infections, especially pneumonia[14].

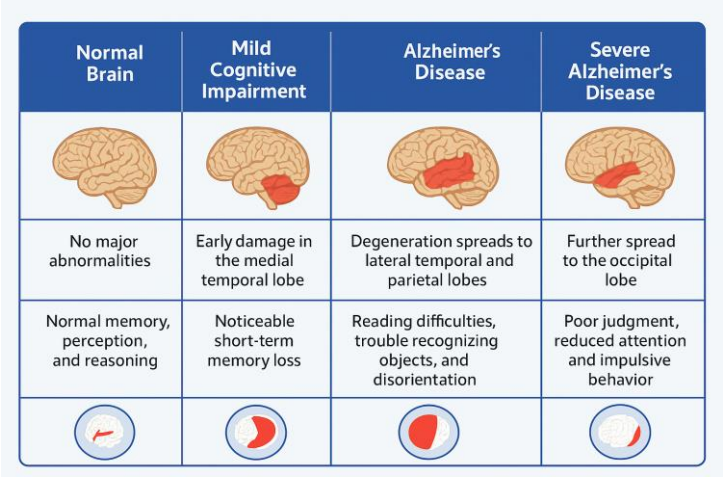
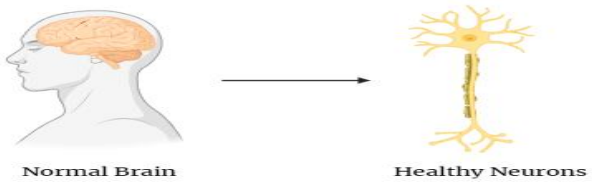


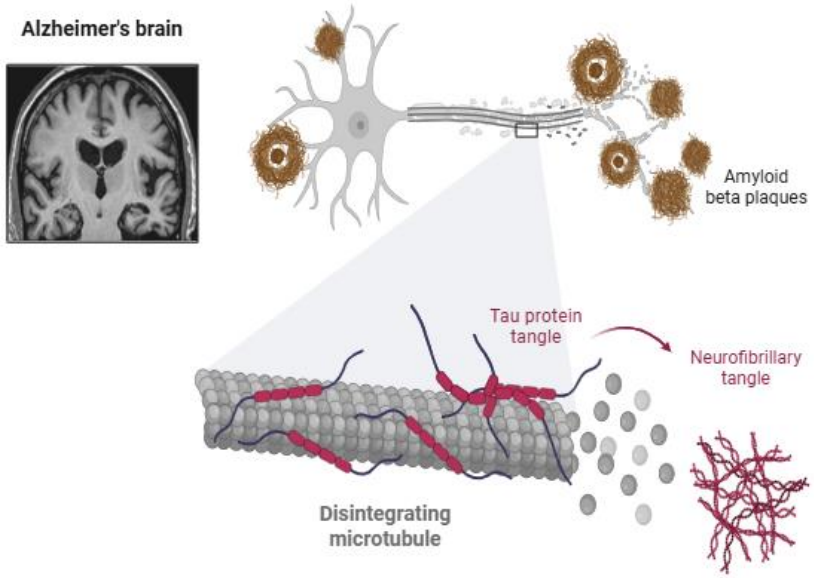
Figure 1: The stages of AD. The normal brain and development of AD were shown with the course of disease stage with appearance of symptoms.

Alzheimer's disease's Neuropathology

Tiny changes occur in the brain long before the first signs of memory loss show up.The brain has 100 billion neurons, or nerve cells. The connections between several nerve cells create communication networks. In addition to nerve cells, the brain contains cells that are specialized to support and feed other cells. Groups of nerve cells perform specialized tasks. Some are involved in cognition, memory, and learning. Others help us regulate our muscles, see, hear, and smell. Cells in the brain work like little factories. They receive supplies, generate energy, construct machinery, and get rid of trash. Cells also process, store, and exchange information with one another. To keep everything moving, coordination and a lot of fuel and oxygen are required. Scientists have shown that Alzheimer's illness affects the way some parts of a cell's factory work. They have no idea where the situation starts. But much as in an actual factory, problems in one system might cause problems in others. As damage grows, cells lose their ability to operate, which eventually results in death.[15].



a.



b.

Figure2:The physiological structure of the brain and neurons in(a)healthy brain and(b)Alzheimer's disease(AD) brain

There are two types of neuropathological changes in AD which provide evidence about diseaseprogressandsymptomsandinclude:(1)positivelesions(duetoaccumulation),which arecharacterizedbytheaccumulationofneurofibrillarytangles,amyloidplaques,dystrophic neurites,neuropilthreads,andotherdepositsfoundinthebrainsofADpatients.Inadditionto (2) Negative lesions (due to losses), that are characterized by large atrophy due to a neural, neutrophil and synaptic loss. Besides, other factors can cause neurodegeneration such as neuro inflammation, oxidative stress, and injury of cholinergicneurons[16,17,18].

Senile Plaques(SP)

The extracellular deposits of beta-amyloid protein (Aβ) that make up senile plaques can have a variety of morphological shapes, such as diffuse, dense-cored, neuritic, or classic and compact plaques. The production of Aβ deposits from the transmembrane amyloid precursor protein (APP) is carried out by proteolytic cleavage enzymes such β-secretase and γ-secretase 19, 20, 21.The ultimate forms Aβ40 and Aβ42 are produced when these enzymes break down APP into many amino acid fragments, including 43, 45, 46, 48, 49, and 51 amino acids. Aβ monomers come in a variety of forms, such as soluble oligomers that may spread throughout the brain and huge, insoluble amyloid fibrils that can build up to create amyloid plaques. Since Aβ is crucial for neurotoxicity and neuronal function, the buildup of thicker plaques in the hippocampus, amygdala, and cerebral cortex can result in cognitive deficits as well as stimulation of astrocytes and microglia, damage to axons and dendrites, and loss of synapses.[22,23].

Neurofibrillary Tangles(NFTs)

The loss of cytoskeletal microtubules and tubulin-associated proteins is caused by NFT, which are aberrant filaments of the hyperphosphorylated tau protein that can occasionally twist around one another to form paired helical filament (PHF) and accumulate intraneural perikaryal cytoplasm, axons, and dendrites. The primary component of NFTs in the brains of AD patients is hyperphosphorylated tau protein, and its evolution can represent the morphological phases of NFTs. These stages include: (1) pre-tangle phase, one kind of NFT in which phosphorylated tau proteins are collected in the somatodendritic compartment without the formation of PHF, (2) mature NFTs, which are distinguished by tau protein filament aggregation and nucleus displacement to the soma's periphery; and (3) extracellular tangles, also known as the ghost NFTs stage, which arise from neuronal loss brought on by high levels of filamentous tau protein that are partially resistant to proteolysis.[24,25].

Synaptic Loss

Memory impairment results from synaptic loss in the limbic system and neocortex, which is often seen in the early stages of AD. Defects in axonal transport, oxidative stress, mitochondrial damage, and other processes can all contribute to tiny fractions, such as the buildup of Aβ and tau at the synaptic locations, as part of synaptic loss mechanisms.These mechanisms ultimately result in axonal dystrophy, pre-synaptic terminal loss, and dendritic spine loss.[26]. Neurogranin, apostsynaptic neuronal protein,

visinin-like protein-1 (VILIP-1), and synaptotagmin-I are examples of synaptic proteins that function as biomarkers for the identification of synaptic loss and severity.[27,28].

Alzheimer's disease Hypothesis: The brain contains billions of neurons, each of which has an axon and many dendrites. For neurons to remain healthy, they must perform metabolism, repair themselves, and communicate with one another. Many overlapping processes have been proposed to explain the underlying pathophysiology of AD, and current and potential future therapeutics are based on changing these pathways.(Figure 3).

Amyloid cascade hypothesis: The amyloid hypothesis of AD, which holds that abnormal processing of the amyloid precursor protein (APP) produces amyloid beta (Aβ) 29, gained traction in the 1990s. Aberrant Aβ synthesis30 may arise from changes in the method by which secreted enzymes break down APP, including alterations in gamma and beta secretes. Aβ can initiate a cascade that leads to synaptic dysfunction and cell death, ultimately resulting in the pathological hallmarks of AD, including amyloid plaques and neurofibrillary tangles (NFTs), which are composed of hyper phosphorylated tau protein.[31]

The Tau theory : Tau is a protein that is produced by neurons and usually aids in the stabilization of microtubules in the cell cytoskeleton32. Hyper phosphorylation causes it to accumulate inside nerve cell bodies forming these NFT masses. Thus, the aberrant connections that these tangles have with cellular proteins prevent them from carrying out their usual activity. Hyper phosphorylation, which occurs downstream of Aβ 32, may be triggered by Aβ accumulation, according to research. Additionally, there is evidence that toxic tau might trigger a feedback loop that increases the production of Aβ.[33]

Cholinergic hypothesis: The identification of a cholinergic deficit in AD patients' brains, which was caused by deficiencies in the enzyme choline acetyl transferase34, was a first significant discovery in the field in the 1970s. This sparked efforts to therapeutically boost cholinergic activity and led to the cholinergic hypothesis of AD, along with the realisation of the importance of acetylcholine in memory and learning. One late aspect of the neurodegenerative cascade is cholinergic depletion. Cholinesterase inhibitors increase cholinergic transmission by blocking the cholinesterase enzyme, which hydrolyses acetyl choline at the synaptic cleft.

Excitotoxicity: Excitotoxicity, which is defined as excessive exposure to the neurotransmitter glutamate or overstimulation of its N-methyl-D-aspartate (NMDA) receptor35, is primarily responsible for the gradual death of neurons in AD. The loss of cholinergic neurons, which results in an overabundance of calcium entering cells, is thought to be impacted by this process.

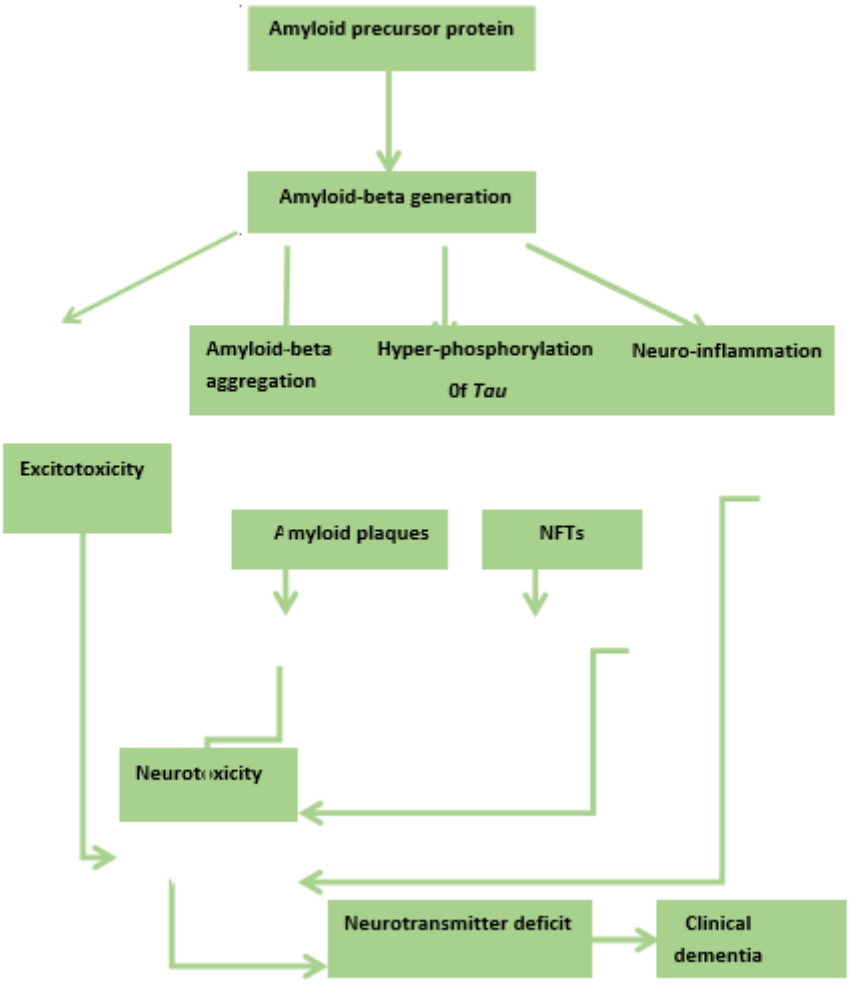


Figure 3: Etiology of Alzheimer's disease with therapeutic targets.

A – secretase enzyme inhibitors; B – NMDA receptor modulators– immune-therapy, including immunization and direct ant amyloid therapy, including monoclonal antibodies; D–anti-tau therapy–anti-inflammatory treatment, F–anticholinesterase inhibitors,APP=amyloid precursor protein;NFTs=neuro fibrillary tangles;NMDA=N-methyl-D aspartate;NSAIDs=non-steroidal anti-inflammatory drugs.

Treatment options of Alzheimer's disease

As of right present, AD has no recognized cure. More than 250 clinical trials have been conducted on a variety of medications, including several that can eliminate Aβ plaques from the brain. They have all failed to halt the disease's progression. [36].

Inhibition of enzymatic breakdown of acetylcholine: Acetylcholine is a crucial neurotransmitter that governs memory and cognitive processes. Acetyl-cholinesterase (AChE) inhibitors, including galantamine, rivastigmine, and donepezil, are approved to treat dementia in AD patients by preventing its enzymatic breakdown [25]. However, bradycardia, orthostatic hypotension, diarrhoea, vomiting, nausea, exhaustion, sleeplessness, appetite loss, and weight loss are all possible side effects of

these medications[37].The therapeutic importance of the success of all the pharmacologic inhibitors of various enzymes linked to the development of AD is debatable because, while they may slow down the disease's course, they neither dramatically improve cognitive function nor cure it[38].

Current research and possible wagents : As of 2018, 63% of the 112 medications in phase I, II, or III trials in the AD drug-development pipeline are disease-modifying therapies, which are intended to change the course of AD and improve outcomes rather than address its symptoms. [39] About 25% of the drugs being developed are being investigated for their ability to enhance cognition, while 10% are intended to lessen behavioural symptoms including agitation, apathy, and sleep issues.[40 41,42].

Inhibition of tau protein: Neurofibrillary tangle development is linked to the protein tau. 44. Seven tau immunotherapies are undergoing phase I and II trials to evaluate novel approaches after initial studies for reducing tau aggregation failed[44].

NMDA (N-methyl-D-aspartate) receptor antagonists: Through the NMDA receptor, which transmits the chemical or electrical signal, glutamate can bind to a cell and let calcium to enter the cell. This helps with memory and learning. However, too much glutamate is given to the neuronal cells in AD, which can be harmful. Despite blocking glutamate's capacity to "dock," NMDA receptor antagonists allow essential information to flow between cells. In both the US and Europe, memantine, often referred to as Namenda XR, is an NMDA receptor antagonist that is approved for use in the treatment of AD.[45]

Inhibition of serotonin uptake: Due to the paucity of disease-modifying medications, strategies to prevent or delay the onset of AD are being given priority. Amyloid burden, tau deposits, and neurogenesis—pathophysiological markers of AD—are all positively impacted by selective serotonin reuptake inhibitors, according to findings from animal studies. In humans, studies on people with a history of depression also showed that AD development was delayed in those who received the majority of selective serotonin reuptake drugs. To clarify the dose-effect relationship of certain serotonergic antidepressants on the prevention of AD, a large-scale randomized controlled trial with a prolonged follow-up period is necessary, but, due to methodological differences among studies.[46]

Antioxidants: Free radicals tend to build up in nerve cells as we age, and oxidative stress may be the cause of AD47. Alzheimer's disease is treated with a variety of antioxidants, such as beta-carotene, resveratrol, and vitamins C and E 48,49. Even though the antioxidant link is a prominent issue in Alzheimer's research, everyone believes that more study has to be done.[48,49]

Supplements: Some people have tried unconventional therapies such coenzyme Q10, coral calcium, huperzine A, and omega-3 fatty acids to prevent or cure AD. Insufficient study has been conducted to ascertain their effectiveness.[50].

Drug therapy: A new era in AD treatment has begun, with some research trials purportedly concentrating on the mechanisms underlying the disease process. It is still debatable, though, how best to block these processes and which of the processes being targeted are indeed necessary for the illness to proceed. In this brief overview, we will attempt to describe the molecular basis of the several therapies being considered and identify areas that need more investigation. Three different fields have produced mechanism-based medications:

- Therapies that target development of tau or neurofibrillary tangle.
- Therapies that target production or deposition of amyloid.
- Therapies that target "neuroinflammation" or the gliosis that occurs in conjunction with tangle and amyloid formation.

No attention will be given to therapeutic initiatives that lack a clear molecular basis. Finding a workable cure does not necessarily require understanding the genesis of the disease, but being aware of the molecular targets beforehand greatly promotes rational translational research.[51]Medication may be a crucial part of a person's Alzheimer's disease treatment. However, because drugs can only relieve certain symptoms, they should only be used as one part of a patient's therapy.

Non-pharmacological therapies, activities, support, education, and direction are all necessary to help someone with Alzheimer's disease live well.[52] The majority of AD research over the last decade has concentrated on disease-modifying therapies that would alter the disease rather than just treat its symptoms. However, the lack of effective drugs that have been developed as a result of these studies shows how difficult it is to develop a therapeutic agent that can change the course of a disease as complex as AD.[53]

CLASSIFICATION OF DRUG USED FOR THE TREATMENT OF ALZHEIMER'SDISEASES

Drug Name	Drug Type and Use	Working	Common Side Effects
Donepezil	Cholinesterase inhibitor prescribed to treat symptoms of mild ,moderate, and severe Alzheimer's.	Prevent the breakdown of acetylcholine in brain	Nausea, Diarrhea, vomiting, muscle cramps, fatigue ,weight loss
Rivastigmine	Cholinesteraseinhibitorprescribedtotreatsymptomsofmild ,moderate,andsevereAlzheimer's.	Prevent the breakdown ofacetylcholine andbutyrylcholine(abrain chemical similar to	Nausea, Diarrhea, vomiting, muscleweakness,indigestion ,weightloss

		acetylcholine)	
Galantamine	Cholinesteraseinhibitorprescribedtotreatsymptomsofmildtomoderate Alzheimer's.	Prevent the breakdown ofacetylcholineandstimulate the Nicotinicreceptortoreleasemoreacetylcholine receptor.	Nausea,Diarrhea,vomiting,dizziness,headache,decreasedappetite.
Memantine	N-methylD-aspartate(NMDA)prescribedtotreat moderate to severe Alzheimer's.	Blockthetoxiceffect associated with excess glutamate andregulatesglutamate activation	Dizziness, headache ,Diarrhea,constipation ,confusion.

Figure4: Showing classification of Drugs used for treatment of Alzheimer's Diseases with their side effects.

Signs and Symptoms of Alzheimer's disease:

- Memory Loss.
- Challenges in planning or solving problems.
- Difficulty completing familiar tasks at home, at work or at leisure.
- Confusion with time or place.
- Trouble understanding visual images and spatial relationships.
- New problems with words in speaking or writing.
- Misplacing things and losing the ability to retrace steps.
- Decreased or poor judgment.
- Withdrawal from work or social activities.
- Changes in mood and personality: [55]

Pharmacotherapy of Alzheimer's disease:

There are four drugs for Alzheimer's disease:

- Donepezil
- Rivastigmine
- Galantamine
- Memantine

Galantamine, donepezil, and rivastigmine: All function similarly and are referred to as "acetyl cholinesterase inhibitors (This is frequently abbreviated as cholinesterase inhibitors).

Memantine, sometimes referred to as a "NMDA receptor antagonist," functions differently from other medications.

Cholinesterase Inhibitors (Galantamine, Rivastigmine, and Donepezil): A molecule known as ac-etylcholine is found in lower concentrations in the brain of an individual suffering from Alzheimer's disease. Acetylcholine facilitates communication between specific nerve cells. Acetylcholine-using nerve cells are also lost in Alzheimer's disease. Over time, Alzheimer's disease symptoms worsen as a result of these brain alterations. Galantamine, donepezil, and rivastigmine all inhibit the breakdown of acetylcholine by an enzyme known as acetyl cholinesterase. This indicates that acetylcholine levels are higher in the brain, which improves nerve cell transmission. For a period, this could lessen some of the symptoms of Alzheimer's. The mechanisms of action of the three cholinesterase inhibitors are comparable. However, some people may respond better to one medication than another. For example, a person may have fewer adverse effects from a single medicine.

Memantine

Memantine functions differently than galantamine, rivastigmine, and donepezil.Another substance that facilitates communication between brain nerve cells is glutamate. However, too much glutamate is created when Alzheimer's disease damages nerve cells. The nerve cells are further harmed by this. By preventing the consequences of excessive glutamate, memantine shields nerve cells.

Side effects:

Cholinesterase inhibitors and memantine are generally safe for most persons to consume.The most frequent adverse effects of galantamine, rivastigmine, and donepezil are:

- Loss of appetite
- Nausea
- Vomiting
- Diarrhea

Muscle cramps, headaches, lightheadedness, exhaustion, and sleeplessness are other adverse effects. People who begin therapy by taking the lowest advised dose for at least one month may experience fewer side effects

Delivery Method of Drugs

Donepezil

Both solid and oro-dispersible tablets containing 5 mg or 10 mg of donepezil are available. It also serves as a remedy. One dose of donepezil is used daily, often right before bed. After a month, if needed, the dosage is raised to 10 mg per day from the initial 5 mg. 10 mg is the maximum authorized daily dosage.

Rivastigmine: Rivastigmine is available as a solution and as 1.5–6 mg pills. It is taken twice daily with meals in the morning and evening. Individuals begin taking 3 mg daily in two split doses, which often escalate to between 6 and 12 mg daily (at intervals of at least two weeks).When using rivastigmine orally, the maximum

authorized daily dosage is 12 mg. There are also skin patches of rivastigmine available. These have less adverse effects than the capsules and provide daily dosages of 4.6 mg, 9.5 mg, or 13.3 mg. For some who have trouble taking their medications orally, patches can be a better option. Only one patch should be applied at a time, and a fresh patch should be applied to a separate part of the skin to prevent the individual from developing an arash.

Galantamine : For galantamine, a beginning dose of 8 mg per day is advised for four weeks, followed by an increase to 16 mg per day for four more weeks, and then maintenance at a level of 16–24 mg per day. Galantamine is available in pills of 8 mg and 12 mg as well as a twice-daily solution. Only one dose per day is required for slow release capsules (which have XL after the medicine name) and come in dosages of 8 mg, 16 mg, and 24 mg.

Memantine:Memantine comes in two different forms: as a solution and as solid and soluble tablets that range in dosage from 5 mg to 2 mg. Starting at 5 mg per day, the suggested dosage increases by 5 mg per week until it reaches 20 mg per day after four weeks. Memantine's maximum authorized daily dosage is 20 mg.[54]

The Difference betweenAlzheimer'sandTypical Age-RelatedChanges

SignsofAlzheimer's	Typicalage-relatedchanges
Poorjudgmentand decision making	Makingabaddecision oncein awhile
Inabilityto managea budget	Missingamonthlypayment
Losingtrackof thedateortheseason	gettingwhichdayitisandrememberinglater
Difficultyhavingaconversation	Sometimesforgettingwhichwordtouse
splacing things and being unable toretracestepsto find them	Losingthingsfromtimetotime

Figure5:ShowingDifferencebetweenAlzheimer’sDiseasesandTypicalagerelatedchanges

Risk Factors for AD:
Risk factors that increase the development of Alzheimer’s are:

Age
As one ages, the likelihood of having AD increases. The majority of AD patients appear beyond the age of 65. Individuals above 85 years of age have a 50% chance of acquiring AD. According to statistics, almost half of people 85 years of age and older

may have Alzheimer's disease, and 5% of men and women between the ages of 65 and 74 may have the condition. Alzheimer's disease is not a typical aspect of aging, despite its frequency. The age-specific incidence rates of Alzheimer's disease show that the risk increases exponentially with age, doubling in incidence for roughly every six years of extra life. Regardless of geographic location, this exponential risk is rather consistent across research, even if the underlying absolute incidence rates vary.

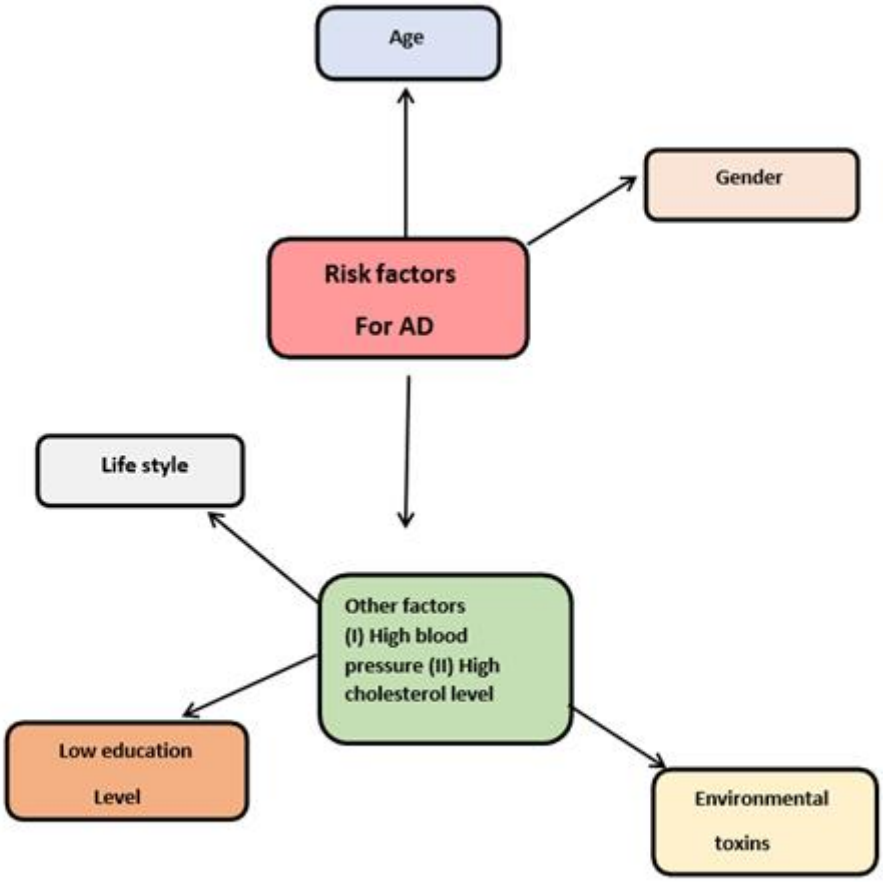


Figure6:ShowingdifferentcausalandriskfactorsforAlzheimer'sdisease.

Family History and Genetics.

Family history is another risk factor. People who have a father, brother, or sister with AD are more likely to have the illness than people who don't have a first-degree family with AD, according to research. While certain genes may serve as risk factors, the great majority of AD cases are not inherited 56. If more than one family member is unwell, the danger rises. Approximately 0.1% of instances of AD are genetically recognized, and these types often manifest before the age of 65 57. Only a very small number of persons with AD (about 1%) contain the three genes that scientists have identified as describing those who will get Alzheimer's. About 25% of people carry the Apo lipoprotein E (APOE-E4), which raises the risk of AD, while it is not a given that those who have it will get the illness.

Other Risk Factors.

In addition to genetics, age, and family history, there are additional significant risk factors that might raise the chance of AD. In light of this, some encouraging evidence indicates that methods for maintaining and leading a healthy aging lifestyle may support brain function and maybe offer some defense against AD. These include dietary habits, maintaining a healthy lifestyle, avoiding excessive alcohol and tobacco use, and being socially and physically active.

There is strong evidence that heart health and brain health are related. Numerous disorders that harm the heart and blood arteries In medical practice, the phrase "work with your doctor to monitor your heart health and treat any problems that arise" is frequently used. The heart-head link is further supported by research on donated brain tissue. These findings imply that if strokes or blood vessel damage are also present, plaques and tangles are more likely to result in Alzheimer's symptoms.[58].

CONCLUSION

The most common cause of dementia is Alzheimer's disease, and its prevalence is rising around the world. Disease pathology starts years before symptoms show up. A precise diagnosis can be obtained by imaging, spinal fluid investigations, and neuropsychological testing. Managing the cognitive and behavioral symptoms of Alzheimer's disease dementia can significantly improve people' lives and careers, even if there are no drugs that can slow the progression of the illness.AD pathogenesis comprises of –amyloid plaques and phospho-tau neurofibrillary tangles

- Although old age and heredity are the most important risk factors, other modifiable riskfactorssignificantlyincreasetheprobabilityofgettingAlzheimer's diseased ementia.
- ThereisnoidealdiagnostictestforAlzheimer'sdisease,neuropsychologicaltesting,neuroimaging,andCSF analysis can significantly improve diagnosis accuracy.
- ThereisnocureforAlzheimer'sdisease.Amixofsymptomatictherapyforcognitivedifficulties, identification and prudent control of behavioral disorders, and caregiver supportis ideal for AD management.

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