



A Review on Alzheimer's Disease

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Abstract

Alzheimer's disease, is also known in medical literature as Alzheimer disease, and is the most common form of dementia, which is not curable that as it progress and eventually death. Most of this disease is seen in the old age people of 65 above age, although less prevalent early onset Alzheimer's can occur much earlier. 33 million people worldwide were afflicted with Alzheimer's in 2009. Alzheimer's is predicted to affect 1 in 85 people globally by 2050. It is a progressive degenerative disease that slowly destroys memory and thinking skills. The disease comes on gradually as two abnormal protein fragments called plaques and tangles accumulate in the brain and kill the brain cells. The disease starts from the hippocampus. The few hours or days ago the rest of this might may enters into different regions of the brain and destroys the cells and compromising functions of brain. In the early stages, the most common symptom is difficulty in remembering recent events, known as short term memory loss. When AD is suspected, the diagnosis is usually confirmed with tests that evaluate behaviour and thinking abilities, often followed by a brain scan. However, examination of brain tissue is required for a definitive diagnosis. The main symptom of the late stages of Alzheimer's is personality and severe behaviour changes. The disease advances, gradually body functions are lost, ultimately leading to death. On average, the life expectancy following diagnosis is approximately seven years.[9] Fewer than 3% of individuals live more than 14 years after diagnosis. The Alzheimer's disease is a neurodegenerative disorder. In developed countries, AD is one of the most costly diseases to society.

Keywords: Plaques, Tangles, Alzheimer's Disease, Hippocampus

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1. Introduction

It was first described by German psychiatrist Alois Alzheimer in 1907. Alzheimer's, the most common form of dementia. It is a progressive degenerative disease that slowly destroys memory and thinking skills. 5-10% cases are familiar but the most are sporadic. Mostly common symptoms are divided into four stages they are as follows.

Predementia: The first symptom are often mistakenly denined to ageing and stress. The disease is difficult to identify, but it can be identified by the detailed neuropsychological testing can reveal mild cognitive difficulties up

to eight years before a person fulfils the clinical criteria for diagnosis of Alzheimer's disease. The most detectable symptom is memory loss, which shows up as difficulty in remembering recently learned facts and inability to acquire new information. Can be observed at this stage, and remains the most persistent neuropsychiatric symptom throughout the course of the disease. Patients feel that no clinical treatment is required at this stage.

Early dementia: AD does not affect all memory capacities equally. Older memories of the person's life (episodic memory), facts learned, and implicit memory are affected to a lesser degree than new facts or memories. As the disease progresses, people with AD can often continue to perform many tasks independently, but may need assistance or supervision with the most cognitively demanding activities.

Moderate dementia:

Progressive deterioration eventually hinders independence, with subjects being unable to perform most common activities of daily living. Which leads to frequent incorrect word substitutions (paraphasias). Reading and writing skills are also progressively lost. During this phase, memory problems worsen, and the person may fail to recognise close relatives. Behavioural and neuropsychiatric changes become more prevalent. Common manifestations are wandering, irritability and labile affect, leading to crying, outbursts of unpremeditated aggression, or resistance to care giving. Approximately 30% of people with AD develop illusionary misidentifications and other delusional symptoms.

Advanced dementia: During the final stage of AD, the person is completely dependent upon caregivers. Language is reduced to simple phrases or even single words, eventually leading to complete loss of speech. Despite the loss of verbal language abilities, people can often understand and return emotional signals. Persons with Alzheimer's disease will ultimately not be able to perform even the simplest tasks without any assistance. AD is a terminal illness, with the cause of death typically being an external factor, such as infection of pressure ulcers or pneumonia, not the disease itself.

Cause: The cause for most Alzheimer's cases is still mostly unknown except for 1% to 5% of cases where genetic differences have been identified. Several competing hypotheses exist trying to explain the cause of the disease.

Genetics of Alzheimer's disease

Less than 5% of AD is caused by dominant genes that are transmitted through families. In these families, people usually show symptoms well before the age of 65 and symptoms sometimes begin in the 30s. This form of AD is called early-onset familial Alzheimer's disease. Additionally, there are other genes that increase or decrease susceptibility to AD but do not cause the disease. They are presenilin 1 (PS1) on chromosome 14, presenilin 2 (PS2) on chromosome 1, and the amyloid precursor protein gene (APP) on chromosome 21. All of these genes affect the processing of the amyloid precursor protein and increase the generation of toxic beta-amyloid, which creates the plaques in AD. All three of these genes are inherited as autosomal dominant genes, which mean that carriers of the genes have a 50% risk of passing the gene to their offspring. Likewise, other first-degree relatives (parents and siblings) have a 50% chance of carrying the gene. Up to 20% of presenile AD seems to be due to the presence of certain susceptibility genes that cause the disease to occur earlier in life than it would without the gene. These alleles can be the same form or different forms of APOE. APOE 3 is the most common form of the gene and is found in approximately 75% of the population. APOE 4 has been associated with an increased risk for developing Alzheimer's. People with two copies of APOE 4 have a significant increased risk (16-fold) over the general population, and people with one copy have about a 3-fold increased risk. Therefore, until preventative treatment is available, pre symptomatic testing for APOE is not recommended.

Signs & symptoms of Alzheimer's disease

Usually appearing after the age of 60, the first symptom of AD is impaired memory formation, especially for recent events or newly learned information. Important objects such as check books or wallets may be misplaced and lost. In the kitchen, pots can be left on the stove resulting in burnt food or small fires. As AD progresses, details or even the occurrence of recent events may be forgotten. Implicit and semantic memory, as well as long-term memory, remain relatively intact early, but decline in these forms of memory eventually develops. While memory is a key feature, AD is also defined by a decline in visuospatial skills, language, abstraction, planning and organization. Visuospatial problems may cause a person to become disoriented or lost in familiar environments. Accidents or becoming lost while driving can occur. Behavioral symptoms are also common in AD. Apathy or decreased motivation causes affected individuals to appear lazy and indifferent. Depression is also common. In some cases, the onset of depression late in life may precede the cognitive symptoms of AD. Delusions and hallucinations can appear at any stage of Alzheimer's, but usually occur a few years after AD is diagnosed.

2. Treatment

Cholinesterase inhibitors, rivastigmine, and galantamine, can help manage Alzheimer's, but they do not cure or reverse the course of AD. A cholinesterase inhibitor is designed to stop the activity of acetyl cholinesterase, thereby slowing the breakdown of acetylcholine. By maintaining higher levels of acetylcholine, the drug may help compensate for the loss of functioning brain cells. It appears that all individuals with AD will progress over the

long-term despite treatment. Generally, cholinesterase inhibitors are well tolerated. Symptoms such as nausea, vomiting, loss of appetite, and increased frequency of bowel movements may occur with any cholinesterase inhibitor. Patients taking acetyl cholinesterase inhibitors should be monitored when they have physical conditions that might be worsened by cholinergic drugs such as some heart conditions, and when they are taking other cholinergic drugs. Nausea, dizziness and diarrhea are the most common side-effects, although some patients show worsening of dreams. A variety of medications are prescribed, with variable success, for psychiatric behavioral problems associated with AD and other dementia. Hallucinations, paranoia, delusions, severe agitation with aggressive/combatative features and depression may require more potent (and toxic) psychotherapeutic agents, although their use should be considered with caution. Non-pharmacological interventions can be beneficial for people with AD. A regular exercise regimen may increase energy levels, reduce apathy and improve the overall sense of well-being. Since lack of motivation can be significant in AD, a personal trainer may assist in compliance with the exercise program.

Mechanism of action

The cause and progression of Alzheimer's disease are not well understood. Research indicates that the disease is associated with the following

1. Amyloid Plaques and
2. Tangles in the brain.

Neurons have an internal support structure partly made up of microtubules. A protein called tau helps stabilize microtubules. In AD, tau changes, causing microtubules to collapse, and tau proteins clump together to form neurofibrillary tangles.

AD and the Brain

The Changing Brain in Alzheimer's disease

No one knows what causes AD to begin, but we do know a lot about what happens in the brain once AD takes

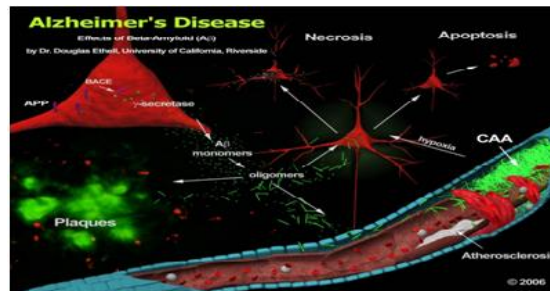


Figure 1

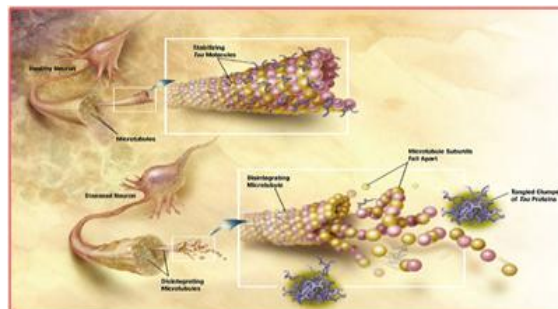


Figure 2

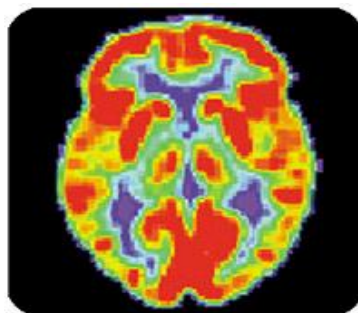


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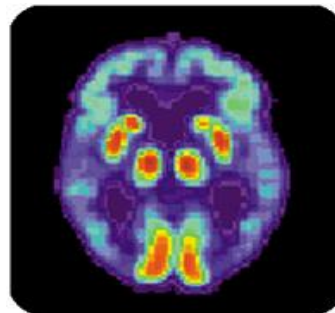


Figure 4

3. Conclusion

As the drugs are not effective to cure, one should be affectionate to support the patient. Dementia is a life-threatening degenerative disease. Although people with dementia often exhibit behaviours that are challenging for family and professional caregivers to manage, the behaviours are caused by damage to the brain and are not intentional. People with dementia need to be treated with kindness and with the knowledge that they can still enjoy life. Family caregivers play a critical and often-overlooked role in the care of loved ones with dementia especially in the early to moderate stages. Caregiver training is an essential component for anyone caring for a person with dementia. Once in a facility, professional caregivers must be trained to view the person with ADRD in the context of a family. Education and training in ethical decision making and conflict resolution are invaluable tools to improve the experience of those with dementia.

4. Acknowledgements

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