International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

# Alzheimer's Disease and Its a Diagnosis, Symptoms, Pathophysiology, and Treatment

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**Abstract**

Alzheimer's disease (AD) is the most prevalent form of dementia, predominantly affecting individuals over 65 years old, though a rare form can manifest in younger people. Globally, AD accounts for approximately 75% of the more than 35 million dementia cases, with projections suggesting the number could rise to 115 million by 2050. The precise etiology of Alzheimer's remains largely unknown. Historically, dementia has been recognized since ancient times, with significant milestones in understanding and terminology occurring from the 17th century onwards. Alzheimer's disease is identified by symptoms such as confusion, personality changes, language difficulties, mood swings, and short-term memory disturbance. Pathophysiologically, AD is characterized by amyloid plaques and neurofibrillary tangles (NFTs) which cause brain damage. Diagnosis involves clinical evaluation, neuroimaging, neuropathological findings, and cerebrospinal fluid analysis. Risk factors include genetic predisposition, vascular issues, and psychosocial elements. Current treatments focus on acetylcholinesterase inhibitors to manage symptoms, particularly in the mild to moderate stages of the disease.

**Keywords:** Alzheimer's disease(AD), diagnosis, symptoms, risk factors, and treatment, dementia.

## Introduction

Alzheimer's disease is the most common type of dementia. It is a eventually leads to death.The disease is usually found in people over 65, a rare from can appear in younger people. At globally Alzheimer's disease affect about 75% of the more than 35 million people with dimentia. The people with a d is expected to double every 20 years.so by 2050, around 115 million people omight have the disease. The exact cause of Alzheimer's are mostly unknown.

## Historical background

History of dimentia dates back to ancient times. Around 2000 BC, she Egyptian noted the memory decline with age growth. In the second century A.D, arethus ditiguished between reversible delirium and irreversible dementia. During middle ages, dementia was often viewed as decline punishment. Thomas willis coined neurology and academically describe vascular dementia in 17th century . The term dementia was accepted in late 18th century by Philippe pinel. In 19th century otto binswanger and alois alzheimal studied dementia causes, leading to the term Alzheimer's disease.

**Symptoms**

- Confusion
- Personality changes
- Language difficulties
- Unexplained mood swings
- Disturbance in short term memory

**Pathophysiology**

Alzheimer's disease is characterized by two main factors; one is amyloid plaques and NFTS. These are causes brain damage and leads to symptoms of AD.

**1)amyloid plaques**: these are dumps of proteins call beta-amyloid outside brain cells. They mainly consist of two type of beta-amyloid proteins,AB40 and AB42 , with AB42 being more common in plaques. Amyloid plaques usually form in the outer layer of the brain and affected deeper brain structures later.

**2)NFTs**: these are twisted fibres inside brain cell made of a protein called tau, which become abnormally modified. Tau langles Start in areas related to memory and then spread to other part of the brain.

Amyloid precursor protein (app)

⇓

Developed by beta secretase and alpha secretase

⇓

Mutation of amyloid precursor are protein on chromosome number 21

⇓

Increase the production of APP

⇓

Produces of amyloid protein

⇓

Accumulation of beta amyloid protein

⇓

Directly neurotoxin

⇓

Alzheimer's disease

**Diagnosis**

**Key diagnostic steps:**

1. **clinical evolution**: slow, progressive dementia is primary sign.
2. **Neuroimaging**: brain scans (CT,MRI) may show cortical atrophy, and PET scan may show reduce brain metabolism.
3. **Neuropathology findings**: at autopsy, the present of beta amyloid plaques , and amyloid angiopathy confirm AD.
4. **Cerebro spinal fluid (CSF)**:lower level of AB amyloid 42 and higher level of tau protein are indicators of AD.

**Risk factor**

1. Genetic hypothesis
2. Vascular hypothesis :

- Smoking
- Obesity
- High cholesterol
- Hypertension
- Diabetes and
- Stroke associated with higher AD risk.

3. Phychosocial hypothesis :

- Low education increases AD risk.
- Strong social network and engagement lower AD risk, while isolation increases it.
- Physical activities etc.

**Treatment**

Medication:

**1. Acetylcholinesterase inhibitors:**

- Includes doneperil,galantamine ,and rivastigmine .
- Disease Ach in the brain to improve symptoms.
- Effective in mild to sever AD, particularly in mild to moderate stages.

**Conclusion**

Alzheimer's disease remains a significant global health challenge with increasing prevalence expected in the coming decades. Despite its unclear etiology, advancements in diagnostic techniques and understanding of its pathophysiology, such as the roles of amyloid plaques and NFTs, have improved the ability to identify and study AD. Risk factors encompass genetic, vascular, and psychosocial aspects, highlighting the importance of a comprehensive approach to prevention and management. While treatments like acetylcholinesterase inhibitors provide symptomatic relief, ongoing research is crucial for developing more effective interventions to combat this debilitating disease

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