

# Cure for Alzheimer's Disease

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Received 26 July 2015; accepted 26 September 2015; published 30 September 2015

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## Abstract

Alzheimer's disease (AD) is progressively being recognized amongst the most vital medical and social issues in older individuals in industrialized and non-industrialized countries. To date, just symptomatic medications exist for this disease, all attempting to offset the neurotransmitter disturbance. Recently, cholinesterase inhibitors (CIs) are now accessible and have been authorized for the treatment of mild to moderate AD. Further remedial alternative available for moderate to severe AD is memantine, an N-methyl-D-aspartate receptor noncompetitive antagonist. Treatments equipped for halting or slightly adjusting the course of AD are known as "ailment changing" medications, and are still under extensive examination. To obstruct the movement of the ailment, they need to interfere with the pathogenic steps in charge of the clinical symptoms, including the disposition of extracellular amyloid  $\beta$  plaques and intracellular neurofibrillary tangle formation, irritation, oxidative damage, iron deregulation and cholesterol metabolism. This paper discusses the cure for Alzheimer's disease, the current symptomatic treatments and the treatment of mild and moderate Alzheimer's disease and the functions of its drugs.

## Keywords

Alzheimer's Disease, Cure for Alzheimer's Disease, Treatment Drugs, Acetylcholine, Inhibitors

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## 1. Introduction

Alzheimer is progressively being identified as one of the most vital medical issues in older people with a wide-spread presence rising from 1% at the age of 60 to at least 38% at the age of 90 [1]. Around the spectrum of diseases, Alzheimer's disease (AD) is the commonest subtype, accounting for almost 60% of all dementias. It is portrayed clinically by dynamic memory and orientation misfortune and other intellectual deficits, including impaired judgment and making of decision, apraxia and language/dialect disturbances. These are essentially accompanied by various neuropsychiatric indications (*i.e.* depression, apathy, disturbance, agitation, daydream, delusions, and mind flights). The continuing extension of life expectancy, prompting to a rapid growing number

of patients with dementia, especially AD, has prompted an enormous increment in study concentrated on the discovery of drugs for primary, auxiliary or tertiary prevention of the disease. Despite all efforts made by scientists so far, right now there are no effective pharmacotherapeutic alternatives for the prevention and treatment of AD.

The treatments presently available for this disease are only suggestive in nature, trying to counterbalance the neurotransmitter disturbance of the disease. Some cholinesterase inhibitors (CIs) are affirmed for the treatment of mild to moderate AD. Other medications include Galantamine, Donepezil, and Rivastigmine, which help to reduce and slow down the way cells are damaged.

In this paper, the cure for this treatment is discussed, the drugs that can be used to suppress or reduce the damages in the human system and finally, the functions of these drugs are also presented.

## 2. Cure for Alzheimer's Disease

Alzheimer's disease is a neurodegenerative illness characterized by cognition and memory impairment [2]. According to [3], the disease is also characterized by behavioral and psychiatric disorders. Individuals suffering from Alzheimer's sometimes depend on their families to perform their day-to-day activities. According to [4], Alzheimer's disease is the commonest form of dementia among the elderly. The prevalence of this disease among people aged 85 and above is between 25 percent and 50 percent. Despite not having a cure at the moment, there are many medications for the disease. The most common medication for this disease is through cholinesterase inhibitors. Alzheimer's disease is believed to cause the loss of cholinergic neurons in the brain. The decrease of acetylcholine (ACh), a brain neurotransmitter, causes the symptoms of Alzheimer's disease. To correct this deficiency, physicians attempt to increase acetylcholine by hindering its degradation. Increasing this white crystalline compound by hampering its degradation in the brain helps in improving cognition and memory impairment which is a symptom of Alzheimer's disease.

## 3. The Treatment Drugs

The Food and Drug Administration (FDA) has approved about four cholinesterase inhibitors to treat mild, moderate, and severe cases of Alzheimer's disease. According to [5], these inhibitors are used to treat Alzheimer's disease symptoms relating to thinking, judgment, language, memory and other thought processes. One of the cholinesterase inhibitors used in the treatment of Alzheimer's disease is Donepezil. This drug is used to treat all phases of Alzheimer's disease. Rivastigmine and Galantamine, marketed under the brand names of Exelon and Razadyne respectively, are all used in the treatment of moderate to mild cases of Alzheimer's disease. Tacrine, marketed under the name Cognex, is normally used in the treatment of mild and moderate Alzheimer's. However, it is rarely used because it is associated with many side effects. This drug is also rarely used in the treatment of Alzheimer's disease because of frequent dosing requirements and poor oral bioavailability, as in [4].

## 4. Functions of the Drugs

As stated above, these drugs (inhibitors) function by increasing the amount of acetylcholine. Since the nerve ends of the brain cell release acetylcholine needed for the transmission of impulses, nerve impulses help the brain to deliver messages and signals to other cells in the body. When these signals reach the destination cells, chemicals and enzymes like acetylcholinesterase break down acetylcholine so that it can be recycled. The disease normally destroys and damages cells producing acetylcholine, thus reducing the amount of messages that can be transmitted to other cells. Drugs like Donepezil, Rivastigmine, and Galantamine slow down the process at which these cells are destroyed or damaged. These drugs reduce the rates at which these cells are destroyed by completely blocking or slowing down the activities of enzyme acetylcholinesterase.

Galantamine specifically benefits the patient by accelerating the release of acetylcholine compound. Galantamine also benefits an Alzheimer's disease patient by toughening the manner in which recipient cells respond to acetylcholine. Similarly, Rivastigmine also functions by blocking the activities of acetylcholinesterase and other damaging enzymes like butyrylcholinesterase, which is also known as plasma cholinesterase [6]. Donepezil functions by hampering or blocking the activities of acetylcholinesterase. It does not have the capability to block other damaging enzymes like butyrylcholinesterase. According to [7], the treatment of this disease significantly depends on the symptomatic actions of these inhibitors.

## 5. Conclusions

Despite the fact that the Alzheimer's disease does not have a total cure, but since there are symptoms associated with the disease, these drugs can be used to suppress the intensity and level of severity of the disease. The prices of these drugs are basically considerable and research has shown that the average costs per patient for any of these drugs in the United States are almost about \$5.00 each day or around \$1800 per year. Though there are various formulations available at a similar price. Donapezil is sold in form of a tablet and also as an orally dissolving tablet. Rivastigmine is sold as a capsule, a skin patch and liquid while Galantamine appears in standard and extended-release form and also as a liquid.

However, many of these drugs to implement the cure of Alzheimer's disease have been approved by FDA and are being under monitoring while a permanent cure for the disease is still under research and study.

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