

# Brief Review of Traditional Chinese Medicine for The Treatment of Alzheimer's Disease

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## ABSTRACT

Alzheimer's Disease (AD) is a common and frequently occurring disease especially in the elderly with complicated pathogenesis and multiple pathological mechanisms involved. In recent years, there have been a lot of experiments on the exploration of Traditional Chinese Medicine (TCM) on AD, and the prevention and treatment of AD by TCM has also been significantly effective. For the long-term treatment of AD, TCM are particularly suitable for drug discovery. In this review, two TCM treatments for AD are briefly introduced including single herbs with active ingredients and Chinese herbal compounds. These therapies could be very promising methods in the search for potent anti-Alzheimer's drugs and will play an important role in the prevention and treatment of such diseases.

**Abbreviations:** AD: Alzheimer's Disease; TCM: Traditional Chinese Medicine; ACHE: Acetylcholinesterase

## Introduction

Alzheimer's Disease (AD) is a neurodegenerative disorder caused by multiple factors, with a slow and irreversible course and multiple intelligent damage. Low learning, memory and cognitive abilities are common clinical symptoms [1]. As a typical multi-cause heterogeneous disease, AD has developed into one of the major diseases seriously endangering the health of the elderly. AD can be influenced by many factors, A $\beta$  deposit can stimulate the oxidative stress state of tissue cells through more channels, including generating a large number of reactive oxygen species, reducing the variety of the activity of antioxidant enzymes, inducing a variety of oxidative stress, then cause subsequent malignant cascade reaction, such as the decrease in the number of neurons, morphological changes, energy metabolism, mitochondrial capacity obstacles, gene regulation disorder diseases, which in turn lead to the occurrence of apoptosis and end up the body's aging and cognitive impairment. The pathogenesis of AD is summarized in (Figure 1) [2,3].

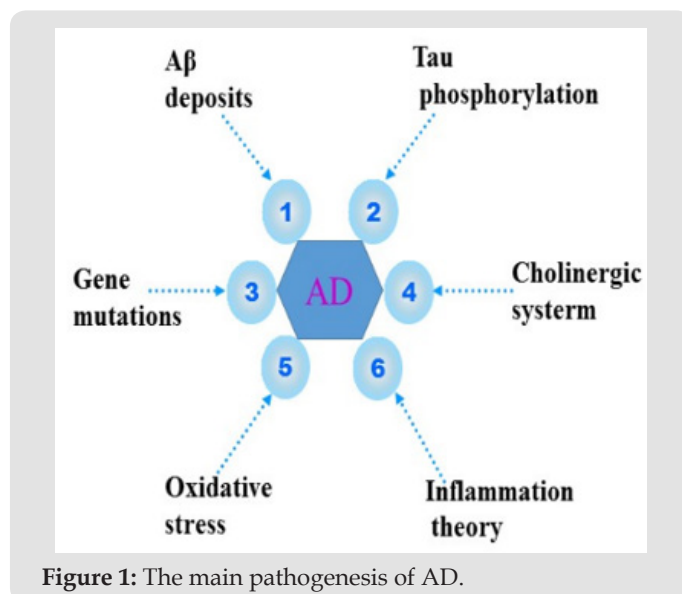


Figure 1: The main pathogenesis of AD.

Donepezil and galantamine, which were often used for AD therapy in clinical globally, can elevate the level of Acetylcholine (ACh) and Acetylcholinesterase (AChE). However, they all mainly target at single etiology and single target, and have some limitations, such as low efficacy, adverse effects for the long-term use [4,5]. AD is caused by the maladjustment of various factors in the elderly body, especially brain tissue. The prevention and treatment of AD cannot be solved by single target or single drug composition, but a comprehensive therapy of multiple components, multiple targets and multiple approaches should be adopted in combination with its pathogenesis. Traditional Chinese medicine, which has multiple targets and multiple approaches in the prevention and treatment of AD, might be make a figure.

### Chinese Single Herbs with Active Ingredients

The single drug and extract of TCM for the treatment of AD mainly include tonic drugs, dishydrating phlegm drugs, activating blood circulation and removing stasis drugs, calming liver and cooling wind drugs, and awakening drugs [6-8]. The active ingredients extracted from Chinese single herbs can play a role in anti-aging, improving immunity and alleviating neuron damage to a certain extent, then play a neuroprotective role in different ways [9,10]. The common use of several TCM in animal models of AD are listed such as Panax ginseng with Ginsenoside Rb1, Ginsenoside Rg3, Panax notoginseng with panax notoginseng saponins, Herba epimedii with icariin and so on.

### Chinese Herbal Compounds

Chinese herbal compounds treatment of AD, including tonifying the kidney and spleen, resolving phlegm and removing blood stasis, waking the brain. Among them, tonic drugs are used most frequently in clinic, which can indicate that deficiency of Yin and Yang and deficiency of qi and blood lead to the loss of brain marrow [11]. Each type has a different representative prescription for treatment. Therefore, clinical medication should follow the principle of supplementing the deficiency, choose the medicine with the function of warming Yang, nourishing qi, nourishing blood and nourishing Yin to restore and adjust the ups and downs of qi, blood and Yin in the body.

### Conclusion

At present, due to the unclear pathogenesis of AD, this has brought some difficulties in the research and development of AD treatment drugs [12], but it has also brought opportunities for the study of the role of TCM in AD. The mild and lasting effect of TCM and the small side effects, and the focus of TCM on the overall coordination of the body, may create a new situation for the treatment of AD. China is rich in TCM resources and have a wealth

of basic theories of TCM, so it has unique advantages to screen and develop single active ingredients and compound preparations of TCM for the prevention and treatment of AD with definite, safe and non-toxic effects from natural products, many of which have multi-target pharmacological activities and promote nerve regeneration, which are worthy of further development.

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