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# Global Perspectives

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## DEMENTIA IN CHINA: CURRENT STATUS

There are 177 million people aged 65 and older living in China, the only country in the world where the elderly population is so large. Dementia is the most common worldwide neurodegenerative disease of aging, and 20% of patients with dementia live in China.[1] It has been estimated that the Chinese proportion of elderly will reach 30.4% in 2050, which will include 100 million elderly people over 80 years old.[2] This rapid increase in patients with dementia in the near future will increase public health and social and economic burden. We aim to illustrate the current status of dementia in China with regard to prevalence, diagnosis, treatment, and care.

**Prevalence.** According to previous epidemiologic investigations, the prevalence of dementia in China was thought to be between 3% and 5% of the elderly population, with Alzheimer disease (AD) the majority, with prevalence around 2%–4%.[3,4] Hereditary and geographic factors, lifestyle, diet, and education can influence the prevalence of dementia. It has been estimated there was a higher prevalence of vascular dementia (VaD) in the northern regions of China (1.1%),[4] which may be due to the higher prevalence of stroke in these regions. Meanwhile, the prevalence of dementia in veterans older than 65 years is 6.6% in the Beijing area.[5] Elderly people with higher education usually had less AD compared with those who were illiterate.[6] In addition to the Han population, dementia prevalence in other ethnic populations in China has also been investigated. A comparative study between the Han and Uyghur populations in northwest China suggested a higher prevalence of AD in Han populations (4.19% vs 3.24%), but VaD was more prevalent in Uyghur populations (1.11% vs 0.97%).[7] Although early-onset familial AD (FAD) is relatively rare, there are some reports of Chinese pedigrees. It has been determined that different mutations in the amyloid precursor protein and presenilin 1 genes are associated with Chinese cases of FAD.[8,9]

**Diagnosis.** According to the Chinese guidelines for dementia, the diagnostic criteria are mainly based on international criteria, such as *DSM-IV*, National Institute of Neurological and Communicative Disorders and Stroke–Alzheimer's Disease and Related Disorders Association, and Alzheimer's Disease Diagnostic and Treatment Centers. Medical history and physical examination are the most important basis for this judgment. In terms of assisting diagnosis, the most common methods include gene screening, neuropsychological assessment, neuroimaging (MRI, CT, and PET), and screening for biomarkers in blood and CSF. Many investigations have explored the association of *APOE* polymorphism with sporadic Chinese AD and have reached the same conclusions as our international colleagues. Moreover, there are also some genetic data focused on specific dementia types, such as Machado-Joseph disease and cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy.[10,11] There are already many memory clinics within China's general hospitals in developed cities such as Beijing, Shanghai, and Guangzhou. However, due to economic factors, certain advanced techniques (gene testing and PET) are not fully covered by primary community health care. Most patients with dementia in the early stages are not hospitalized, but followed up as outpatients. Invasive examinations for early diagnosis such as lumbar puncture and biopsy of brain or olfactory mucosa are usually not readily accepted by patients and caregivers, especially for cases without obvious symptoms. In these cases, physical examination and neuropsychological tests play a vital role in the diagnosis of dementia. The commonly used neuropsychological scales include Mini-Mental State Examination, Montreal Cognitive Assessment (MoCA), Neuropsychiatric Inventory, Activities of Daily Living, and Clinical Dementia Rating. For instance, there are already 5 official Chinese versions of MoCA in Beijing, Cantonese, Changsha, Hong Kong, and Taiwan.[12] As the global practice of autopsy has decreased, there is little information related to Chinese neurodegenerative diseases. An autopsy study of 383 Chinese elderly inpatients demonstrated the proportion of clinical dementia was 20.4% in this cohort, of which 38.5% had VaD and 25.6% had confirmed neurodegenerative dementia after pathologic examination.[13]

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**Treatment and care.** With the advent of the concept of evidence-based medicine, the first-line treatment of dementia in China has included cholinesterase inhibitors such as donepezil and rivastigmine, and NMDA receptor antagonists such as memantine. Meanwhile, Chinese herbs and neuroprotectants may also be prescribed as supplements according to individual conditions. The behavioral and psychological symptoms of dementia (BPSD) are common, especially in the late stage of dementia. These symptoms result in a very heavy burden for caregivers. Cholinesterase inhibitors and NMDA receptor antagonists have shown benefits in anti-BPSD. The additional choices for BPSD treatment may include antipsychotic drugs, antidepressants, or sedative-hypnotics. Nonpharmacologic interventions have also gained attention and a recent Chinese randomized controlled pilot trial supports the efficacy of cognitive stimulation therapy in the treatment of neuropsychiatric symptoms in AD.[14] Dementia caregivers play an important role in daily care and nonpharmacologic intervention. In China, most caregivers are spouses or children of patients. However, the care burden and psychological health of Chinese dementia caregivers is also a major health problem.[15] It has been found that chronic diseases are developing in long-term caregivers. Effective intervention for caregivers as well as the patients is necessary.

**Outlook.** Despite its late start, dementia research in China has greatly improved, especially in the most developed eastern regions. With the rapid increase of patients with dementia, dementia has been acknowledged as a priority by the Chinese government. Increasingly, medications necessary to treat dementia have become available and are completely or partially covered by national medical insurance. Meanwhile, academic organizations dedicated to dementia have been established, such as Alzheimers Disease Chinese, and other groups coming from the Chinese Neurology Society and the Chinese Geriatrics Society. International communication has also increased through these organizations, but more formal international cooperation is needed. With China's prevalence of dementia cases, more cooperation focused on research is needed both in clinical and basic science.

## AUTHOR CONTRIBUTIONS

Drs. Liu and Wang: study concept and design. Drs. Liu and Tan: searching the literature. Dr. Liu: writing the manuscript. Drs. Liu, Tan, and Wang: critical revision of the manuscript for important intellectual content. Dr. Wang: study supervision.


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# Dementia in China: Current status

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