

# Aspects about Effects of Comorbid Diseases on Cognitive Decline and Dementia Prevention

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## Abstract

Comorbidities and cognitive impairments are very common in the elderly. Alzheimer's Disease is a complex, polygenetic and environmental disease. It takes at least 20 years to develop. Most of the greatest risk factors for late-onset Alzheimer's are identified beside possible protective factors. Alzheimer's disease is ultimately fatal, self-management of this chronic disease is important.

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## Comorbidity

Comorbidity can be defined as the co-occurrence of more than one disorder in the same individual [1]. Comorbidity is often associated with worse health outcomes, more complex clinical management, and increased health care costs. Until today there is no agreement, however, on the overall meaning of the term, and related constructs, such as multimorbidity, morbidity burden, and patient complexity, which are not very well conceptualized [2]. Coexisting diseases may have clinically significant effects on patients' well-being and their quality of life [3].

Alone in the United States, about 80% of Medicare spending is devoted to patients with 4 or more chronic conditions, with costs increasing exponentially as the number of chronic conditions increases [2,4].

Comorbidities and functional and cognitive impairments are very common in the elderly and often associated with greater mortality risk [5]. In medical science poor health has been repeatedly associated with an increased risk of cognitive decline and may also be a risk factor for Alzheimer's disease (AD) [6]. Therefore, examining health status in cognitively impaired older adults may be important in identifying the underlying pathogenesis of cognitive decline, and if helpful in predicting dementia risk factors might be relevant to the development of different strategies to delay the onset of dementia [6].

## Alzheimer's Disease

By 2050, the number of people age 65 and older with Alzheimer's dementia is projected to reach 12.7 million people age 65 and older (total and by age) in the U.S. Population [7]. Alzheimer's Disease is a complex, polygenetic and environmental disease. It takes at least 20 years to develop [8,7]. Dementia is an overall term for a particular group of symptoms and characteristics. The characteristic symptoms of dementia are difficulties with memory, language, problem-solving and other thinking skills that affect a person's ability to perform everyday activities and to manage their daily life. Dementia has many causes. Alzheimer's disease is the most common cause or

form of dementia [7]. Alzheimer's disease is ultimately fatal with a typical time-course [7]. Self-management of this chronic disease is important [9] (Figure 1).

## Risk and Protective Factors

The greatest risk factors for late-onset Alzheimer's are older age, genetic factors especially the apolipoprotein e4 gene (APOE-e4) and having a family history of Alzheimer's [7, 10]. APO E is a risk factor - not a cause [8].

Evidence for medical exposures like oestrogen, statin, antihypertensive medications and non-steroidal anti-inflammatory drugs therapy are well documented [11], but additionally psychological conditions like depression can be significantly increase risk of developing AD [11].

Beside many others complex roles of pre-existing disease like hypertension, frailty, carotid atherosclerosis, low diastolic blood pressure, and type 2 diabetes mellitus can be increasing risk factors [11].

## Protective Factors

Although genetics, age, and family history cannot be changed, other risk factors can be changed or modified to reduce the risk of cognitive decline and forms of dementia. A few examples of modifiable risk factors are physical activity, smoking, drugs, education, staying socially and mentally active, blood pressure, and diet. In fact, the

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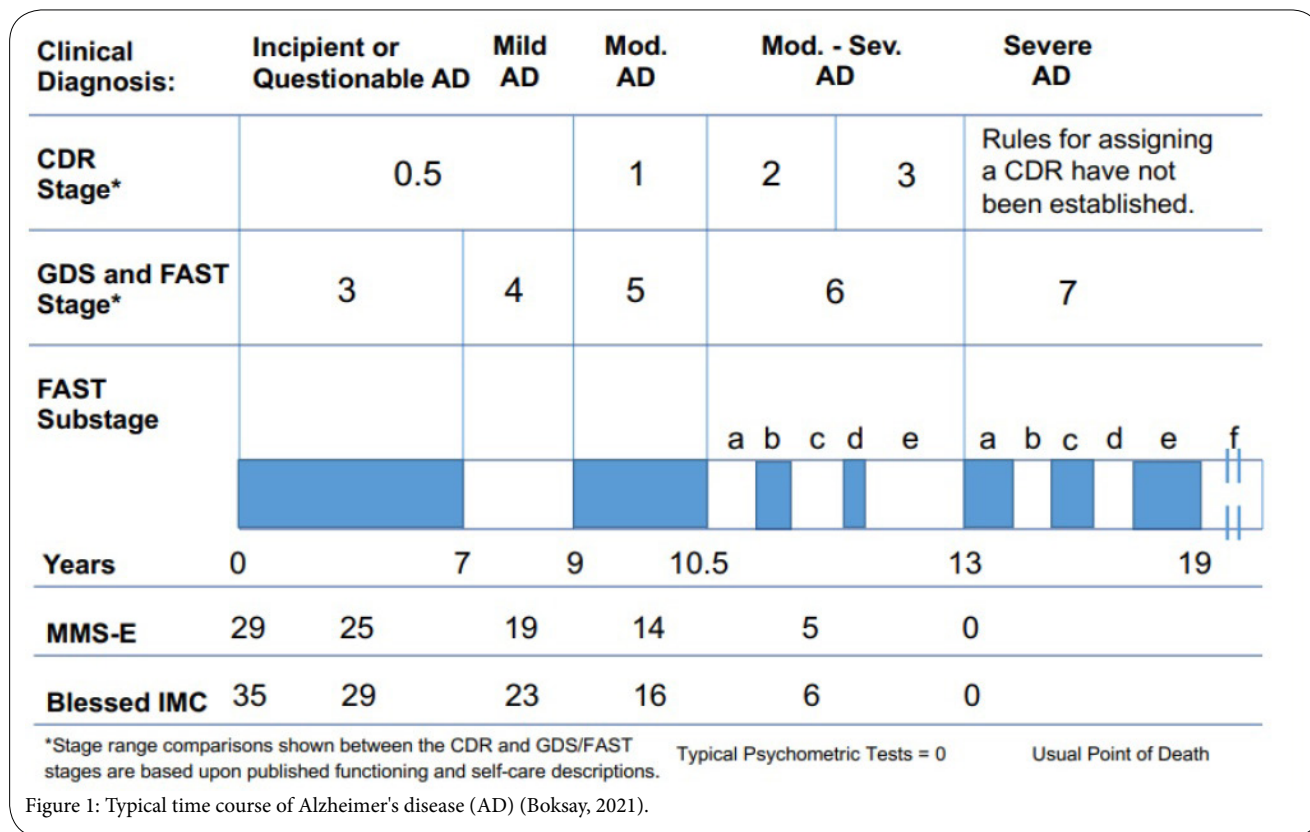


Figure 1: Typical time course of Alzheimer's disease (AD) (Boksay, 2021).

2020 recommendations of The Lancet Commission on dementia prevention, intervention and care underline that addressing modifiable risk determinants might prevent or delay up to 40% of dementia cases [7, p.14, 12].

In the same context dietary exposures like folate, vitamin E/C and coffee as protective factors of AD are quite often documented [11].

Nevertheless, a current systematic review [13, 7] of the use of supplements, including vitamins C, D and E, omega-3 fatty acids and Ginkgo biloba, found little to no benefit in preventing cognitive decline, MCI or Alzheimer's dementia. Researchers have begun studying combinations of health determinants and health behaviors for example, blood pressure as a health factor and physical activity as a positive health behavior [7].

### Prevention of Alzheimer's Disease - Recommendations for the Patient

1. Protect your heart and head
2. Be aware about a good body mass index
3. Push cognitive activities
4. Stay socially and mentally active
5. Stay engaged and social
6. Control your diabetes, hypertension and blood pressure
7. Look for good sleep quality
8. Try to get good primary care [8,14,7,15].

### Competing Interests

The authors declare that they have no competing interests.

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