

Recent Advances in Clinical Trials

Risk Factors for Dementia

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Received: 29 Nov 2022; **Accepted:** 23 Dec 2022; **Published:** 27 Dec 2022

Citation: Faisal A. Alnaser. Risk Factors for Dementia. Recent Adv Clin Trials. 2022; 1(2): 1-4.

ABSTRACT

Dementia is a disease or group of illnesses caused by damage to brain cells. Thus, a person's mental capacities are reduced, and many skills such as memory, language, problem-solving, and thinking are affected emotionally, as well as problems with normal communication, behavior, and normal functioning. The severity of the condition ranges from mild symptoms to severe illnesses that can interfere with a patient's daily activities.

The incidence of dementia is rapidly increasing worldwide, especially among the elderly. Due to the rapidly aging population, the number of people living with this disease is expected to triple over the next 30 years, leading to an increase in the socioeconomic burden associated with dementia. In 2003, dementia was the fifth and eighth leading cause of death for women and men over the age of 65 in the United States, respectively.

Keywords

Dementia, Alzheimer disease, Risk factors, Apolipoprotein E.

Introduction

Dementia is a general term for diseases and conditions that reduce mental ability affecting daily life activities.

It is caused by damage to brain cells that affects their ability to communicate with each other. This impairs memory, thinking, behavior, language, problem-solving skills, and the ability to function normally enough to interfere with daily life.

Warning signs for patients to develop dementia are many. The most important is: Misplacing things (they may not remember where they left their car keys, cell phone, etc.). Or they may find it difficult to perform familiar tasks. Patients may complain of language problems and are not able to use the right words to express themselves. They may be disoriented in time and place. Often, they have impaired judgment and or problems with abstract thinking. Their mood, behavior, and personality are constantly changing. And they lose initiative and become uninterested in new changes.

The Incidence of Dementia

Dementia is not a natural part of aging, but its incidence is rapidly increasing among the elderly population. Today, there are 55 million people with dementia worldwide. And due to the rapid aging of the population, that number is projected to reach 75 million by 2030. More than 60% of them live in lower-middle-income countries. According to the United States 2003 health statistics, dementia was the fifth and eighth leading cause of death for women over the age of 65 and men over the age of 20. This condition depletes health care budgets. It is estimated that over \$800 billion is spent each year on the care of people with dementia worldwide. This is projected to reach \$2 trillion by 2030, increasing the socioeconomic burden associated with dementia [1].

Risk Factors

There are many risk factors for developing dementia, however, the two main aspects are; Familial and genetic background forms of dementia; And other factors that increase the likelihood of getting the disease that is interconnected to demographic characteristics, lifestyle, health conditions, and environmental conditions.

People who have a parent or sibling with Alzheimer's disease (AD) are more likely to have AD themselves. Familial dementia is rare,

occurring in less than 5% of cases. It is caused by an autosomal dominant mutation. Patients could inherit such a gene from one of their parents. Familial genes reliably cause dementia when passed from parent to child. The other type is called the "risk" gene, where more than 20 risk genes have been discovered. They only lead to marginal increases in the risk of dementia but do not necessarily result in dementia. The most important risk gene for dementia is called Apolipoprotein E (APOE). Certain versions [variants] of the APOE gene can make people up to four times more likely to develop AD than those without such genes [2-5].

Age is considered the greatest risk factor for dementia, with older people being more likely to develop dementia than younger people. It is reported to occur in about 2 out of 100 people between the ages of 65 and 69. However, the risk of AD and dementia increases with age, so it is more likely to occur among older people between the ages of 80s to 90s. And it doubles about every five years. This means that about 33 out of 100 of those over their 90s have dementia [2]. In Western countries, the prevalence of AD increases from 1-3% in those aged 60-64 to 35% in those aged 85 and over. This is because older people are at higher risk of developing high blood pressure, cerebrovascular injuries, twists, blockages, and strokes, all of which can lead to dementia.

Gender

Women are more susceptible to disease than men. About two-thirds of people diagnosed with AD dementia are women. This is mainly because women tend to live longer than men, and their sex hormone levels drop during menopause, which could be a risk for developing dementia [6,7].

Ethnicity

People of black African, black Caribbean, and South Asian descent are more likely to develop dementia than people of white descent. In the UK, these ethnic groups are found to be more likely to develop diabetes and cardiovascular disease as they age, while in general some ethnic groups have less access to education and employment opportunities, all of which have been shown to increase the risk of developing dementia [8].

Alzheimer's disease, which is a specific group of neurodegenerative diseases, is said to be the most common cause of dementia, accounting for 60-70% of all cases. AD is reported to be the major type of dementia in the United States [6].

Lifestyle

People adopted lifestyle changes are another major risk factor for developing dementia. According to research, there are over a dozen modified risk factors that can prevent or delay the onset of 40% of dementia. It includes unhealthy behavior [9], lack of physical activity, and excessive alcohol consumption (studies found that heavy alcohol use increased the risk of all types of dementia) [10]. The link between smoking and dementia development was discovered to be significant. Smokers have a higher risk of dementia, whereas quitting reduces the risk to that of never smoking. Exercise: Lack of exercise increases the risk of

the disease. While physically active people are less likely to suffer from mental decline and have a lower risk of developing AD [11].

Poor Diets and Other Health Issues

Saturated and transfat-rich diets have been linked to an increased risk of cognitive decline and dementia [12]. Diabetes, if not controlled, can leave excess sugar in the blood, which can damage organs, including the brain, over time. Hypertension is also linked to an increased risk of cognitive decline and dementia [13].

Obesity, on the other hand, is another risk factor for developing conditions that lead primarily to vascular dementia, as a result of decreased blood supply to the brain and thus damage to the white matter of the brain, resulting in impaired cognitive and intellectual behavior. The association between obesity and an increased risk of dementia is explained by adipocyte-secreted proteins and inflammatory cytokines [14].

Other Health Illnesses

- **Down syndrome:** Significantly increases the risk of developing early-onset dementia and AD, which is due to the lifelong accumulation of beta-amyloid [A β] in the brain [15].
- **Hearing loss:** Dementia has also been found to be more common in patients with hearing loss, particularly when onset occurs in middle age (40-65 years). This could be because people with hearing loss are more likely to be introverted and isolated, which increases their risk of developing dementia [16].
- **Kidney disease:** Patients with kidney disease are more likely to develop dementia, particularly vascular dementia [17].
- Psychosocial stress raises the risk of Alzheimer's disease and vascular dementia [18,19].
- **Parkinson's disease (PD):** Dementia is a common complication of PD, with an annual incidence of approximately 10% in PD patients. The most important factor in the development of Parkinson's Disease Dementia (PDD) is Lewy body pathology (LBD). LBD is a disease characterized by abnormal alpha-synuclein deposition in the brain. Lewy body deposits affect brain chemicals, causing problems with thinking, movement, behavior, and mood. LBD affects over one million people in the United States [20].
- **Frontotemporal dementia:** The frontal and temporal lobes are affected in frontotemporal dementia (FTD) with a progressive syndrome caused by TDP-43 protein accumulation. Symptoms of FTD include personal and behavioral changes such as impulsivity and loss of motivation, language problems such as slow speech, and mental and memory problems [21].
- **Severe head injury:** Head injury is related to an expanded hazard of dementia. Head injury can cause overexpression of β -amyloid precursor protein, driving to the aggregation of β -amyloid stores within the brain. The pathological connection between head injury and AD is due to changes within the cerebral vasculature. Then again, the progression of AD may be quickened by head injury [22,23].
- **Multiple Sclerosis:** Cognitive impairment is a common feature of multiple sclerosis, affecting approximately 40% to 70% of patients [24].

- **HIV:** HIV-1 infection can cause dementia despite successful administration of highly active antiretroviral therapy that extends life [25].
- **Rheumatoid Arthritis (RA):** Having RA increases the risk of developing dementia. First, both have a genetic predisposition. And second, RA causes inflammation that impairs blood flow in the body and brain, limiting brain function due to limited oxygen supply. These changes increase the risk of developing dementia [26].
- **Widows:** Widows, especially young ones, are at risk of social isolation and are prone to depression, and hence more likely to develop dementia [27,28].
- **Depression:** People who have experienced much depression and anxiety in their lives are at increased risk of developing dementia. Because extreme stressful experiences can speed up the aging of the brain [29].
- **Other learning disabilities and decreased cognitive reserve:** Cognitive reserve is a person's ability to cope with diseases of the brain. It is built by keeping the brain active throughout life. There are three important factors that lead to decreased cognitive reserve. i.e., early school dropout, less job complexity, social isolation, etc. The higher the cognitive capacity of a person, the longer it takes for a brain disorder to interfere with daily life. This means that people with a higher cognitive reserve can delay the onset of dementia symptoms, while low cognitive engagement is associated with a higher likelihood of developing dementia [30].
- **Air Pollution:** Exposure to air pollution is estimated to be responsible for 16% of all deaths worldwide [31]. Moreover, air pollution and increased exposure to small particles from traffic exhaust and indoor wood burning increase the risk of hypertension, elevated lipids, atherosclerosis, and oxidative stress, all of which contribute to an increased risk of dementia [32].

The Risk factor load [RFL] means an increased association between exposure to increased risk factor load and consequent cognitive decline or dementia. Studies show that the presence of one risk factor increases the risk of dementia by 20% and the presence of two risk factors increases the risk by 65% [30].

Conclusion

Dementia is a common problem and its prevalence is increasing over the coming years. There are certain recommended changes in behavior and lifestyle that ought to be taken in order to avoid dementia in later life. Such changes include: Maintaining normal systolic blood pressure at 130 mm Hg or less from the age of 40; Controlling body weight and reducing obesity that may lead to diabetes which is one of the major risk factors for developing dementia; Abstaining or limiting alcohol consumption (the latest data shows that any alcohol amount can cause brain shrinkage) [33]; Smoking cessation and avoiding passive smoking while helping others to quit smoking; Reduce exposure to air pollution. Reduce hearing loss by protecting ears from high noise levels and encouraging the use of hearing aids; Prevent head injury (especially in high-risk occupations); Live an active and social life for as long as possible. And finally, exercise regularly most of the

day even if it is light exercise.

Adherence to such measures will not only prevent dementia but can also delay or lessen the onset of dementia when it does occur.

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