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Which diet should providers recommend to patients to help reduce their risk of
cognitive decline and Alzheimer's Disease?

By

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Introduction

Recent studies indicate that in the United States 6.1 million people had clinical Alzheimer's Disease (AD) or mild cognitive impairment in 2017. This number is expected to grow to 15 million by 2060.¹ The World Alzheimer Report of 2015 estimated the global cost of AD to be one trillion US dollars in 2018, and AD is currently ranked as the sixth leading cause of death in the United States.² As life expectancy throughout the world increases, these numbers will continue to grow. Interventions and preventative measures are important to implement in all patient populations as they could delay disease onset or progression. If lifestyle modifications could delay a clinical diagnosis of AD by one year, there would be 9.2 million less AD patients by the year 2050.³

Background

Alzheimer's Disease is the most common cause of dementia. It is distinguished by neuropathologic changes in the brain caused by two proteins: beta-amyloid and tau. These proteins cause neuritic plaques, extracellular deposits of amyloid beta peptides, and neurofibrillary tangles on the brain. Scientists are still unsure as to the cause or origin of these proteins. There also is a genetic component with the identification of the APOE e4 gene found in many AD patients.⁴ With no definitive cause or cure, treatment is difficult to ascertain. Dr. Cummings of the Cleveland Clinic found that between 2002 and 2012, clinical trials for AD medications performed by various pharmaceutical companies had a 99.6% failure rate in finding a medication that was effective against AD.⁴

With this in mind, it is evident that lifestyle changes are an important field to study when discussing the prevention, management and treatment of AD and dementia. This literature review will look solely on how specific diets affect AD and cognitive decline. Sanders et al, a research team at Utah State University found that diet or nutritional status affect the cognitive state of not only nondemented people but those diagnosed with a form of dementia as well.⁵ What people put in their bodies matters; it affects the whole being including the mind. The question that needs to be answered is what diet protects the brain against Alzheimer's disease and cognitive dysfunction?

Dietary Components

The diets discussed in this review are the Mediterranean diet (MeDi), the Dietary Approaches to Stop Hypertension (DASH) diet, and the Mediterranean-DASH for Intervention Neurodegenerative Delay (MIND) diet.

The MeDi was first defined in the 1960s as a diet being high in vegetable oils and low in saturated oils, similar to diets in Greece and Southern Italy. Today, the MeDi consists of consuming extra virgin olive oil, high intake (every meal) of leafy green vegetables, fruits, whole grain cereals, nuts, and legumes. It also includes moderate intake (twice per week) of fish/poultry, dairy products, and red wine and low intake (less than twice per week) of red meat, eggs and sugar. Originally, this diet was linked to reduced incidence of cardiovascular disease.⁶

The DASH was developed in the 1990s when the National Institute of Health funded research to develop a diet specifically for hypertension. A major component of this diet is limiting sodium intake to 1500mg/day. Other guidelines include seven servings of healthy

carbohydrates per day including whole grains, legumes, and beans. The diet also consists of five servings per day of low glycemic fruits and vegetables including leafy green vegetables. Low fat dairy products and lean meat products should amount to only two servings per day. The DASH also focuses on decreasing processed foods and increasing consumption of fresh foods.⁷

The MIND diet was designed by a research team out of Rush University Medical Center in 2015. The team combines the MeDi and DASH diets to create the best option for those struggling with dementia, cognitive delay, or AD. The MIND diet includes ten brain healthy foods: green leafy vegetables, other vegetables, berries, nuts, beans, whole grains, fish, poultry, olive oil, and red wine. It also includes five unhealthy brain foods to avoid: red meats, butter/stick margarine, cheese, pastries and sweets, and fried/fast foods. When observing the MIND diet, patients should adhere to the following guidelines: Eat three servings of whole grains, one salad plus additional vegetables, and one glass of wine each day; use nuts as a snack once a day and beans every other day; eat poultry and berries twice per week and fish once a week.⁸

Discussion

Cognitive Function

Does diet have an effect on cognitive function? A team out of the University of Utah performed the Cache County Study on Memory, Health and Aging. They looked at both the MeDi and DASH diets and found the participants who had high adherence to these diets had higher baseline cognitive function than their counterparts with low adherence. They found participants had cognitive function levels of persons equivalent to three years younger. They also found whole grains, nuts, and legumes had a higher association with high cognitive scores.⁹

Similarly, Dr. Tangney and her team studied cognitive decline as part of the Memory Aging Project, a Chicago cohort study of older persons. They also found that of the 826 older individuals they studied, those with high adherence to MeDi or DASH dietary patterns had slower rates of cognitive decline.¹⁰ In 2015, Morris et al created the MIND diet and looked at its relation to cognitive decline. This team used the Chicago-based RUSH Memory and Aging Project (MAP) and studied 960 participants with an average age of 81 years. They found that individuals with high adherence to the MIND diet had a slower cognitive decline, and a cognitive function equivalent to persons aged seven years younger, than those with low adherence to the MIND diet.¹¹ This result is more significant than the results found by the study out of Cache County which only found a cognitive function level of three years difference.⁹ This can support the statement that the MIND diet is superior in slowing cognitive decline than the MeDi or the DASH diet. Furthermore, a research study out of Australia studied the MIND diet vs the MeDi and their effects on cognition with a 12- year longitudinal cohort study. They found that there was a 19% reduction in cognitive impairment with adherence to the MIND diet over the MeDi.¹²

Alzheimer's Disease

Diet also has an effect on AD. Scarmeas and team, out of Columbia University Medical Center, found that high adherence to the MeDi was associated with 32-40% reduced risk of developing AD in 2009.¹³ They were also looking at other lifestyle habits such as physical activity and reduced incidence of AD, but they were studied independently. This team also looked at AD mortality and found that individuals with AD who had a high adherence to the MeDi had a 67% lower risk of death. Those with a lower adherence score (in the middle tertile) had a 29% reduced risk.¹⁴

The MIND diet was also found to have reduced incidence of AD. The Morris team evaluated a prospective study of 923 members aged 58-98 over four and a half years. They looked at the participants' adherence to the MIND diet compared with the DASH and the MeDi. Participants who had the highest adherence to the MIND diet had a 53% reduced rate of developing AD compared with participants who had the lowest adherence to the same diet. Those with moderate adherence to the MIND had a 35% reduced rate of being diagnosed with AD compared to the lowest adherence group. The team also found that only the participants with the highest adherence to the DASH or the MeDi affected the rate of AD incidence at 39% and 54% respectively. Moderate or low adherence to either the DASH or the MeDi did not have a significant reduction of AD incidence. The study does admit that the data is limited due to the observational nature of the study.¹⁵

Conclusion

Overall, it is evident that adhering to a healthy diet or a diet low in saturated fats, sugars, and fried foods and high in leafy greens, nuts, legumes, and fish/poultry will protect brains from cognitive dysfunction. The MIND diet was designed to be the best diet for patients with dementia conditions including AD. The limitations in determining which diet is the most effective lie in study design. Most studies used longitudinal cohort studies to measure adherence to different diets. The studies that show the best data are usually double-blind clinical trials. Also, very few studies compared one diet to another like the Morris team did by comparing MIND, DASH, and MeDi. To learn more about these different diets and their effects on dementia, there needs to be more randomized control clinical studies performed on the target population and the individual diets. Diets are not the only actions that affect the body; other lifestyle modifications are important as well to see how all factors work together to protect the

brain. It is important to perform more multicomponent studies that account for both diet and physical activity or diet and comorbidities. It is also worth looking into other disease states and comorbidities and their effects on dementia and cognitive impairment and how diet can reduce those risk factors.

How do providers motivate their patients to adopt these practices? More studies evaluating diet and its effect on brain health, will help to convince patients that adopting these healthy habits will help reduce risk from Alzheimer's Disease.

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