

The Effects of Nitrate Supplements on Cognitive Function of Young Adults

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Abstract

How individuals can improve their cognitive functions to prevent cognitive decline is a significant health problem. It is estimated that more than 100 million adults worldwide will develop dementia by 2050. The health cost to take care of dementia patients is vast, with a projected amount of 604 billion spent in 2010 (Dietary factors and Cognitive decline). There have been many different types of research that have tested methods to combat cognitive disabilities. Specifically in dietary habits, the most successful diets that showed improvements in a person's cognitive function were the Mediterranean diet and DASH diet. As found by the literacy review by P.J Smith and J.A Blumenthal, both these diets were very high in nitrates.

From this observation, many future experiments have focused on nitrate supplementation; Many of them showing signs of improvement. For example, the study done by Christopher Thompson and his colleagues had concluded that implementing beetroot juice (a high source of nitrates) improved reflexes and decision making when it came to athletes during their game. With this experiment, I hope to build on the growing knowledge of dietary supplements used to improve cognitive ability.

Purpose of Study

The purpose of this study is to determine the effects of short-term dietary nitrate supplementation on vascular and cognitive function in college-aged individuals.

Research Question

Can short-term dietary nitrate supplementation change cognitive or vascular function in college-aged individuals?

Methods

Participants

- Individuals between 18 and 30
- Both athletic and nonathletic

Procedure

- Participants will be recording their normal diet for 3 days on Mypal app
- Will have their VO2 levels, cognition, blood pressure, and artery measured
- Will continue their regular dietary habits and take 140ml of beetroot juice daily.
- Participants will have VO2 levels, cognition, Blood pressure, and artery measured

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Background / Context

Cognitive impairment defined as "one of a number of different clinical conditions specified by consensus statements and is typically diagnosed based on clinical criteria".

- More than 100 Million adults projected to have dementia by 2050
- \$604 billion spent to help dementia patients in 2010
- Studies have focused on different lifestyle to come up for solutions
- With Dietary habits, Mediterranean and DASH diet are only ones to show positive and consecutive results. With both diets having high levels of nitrates

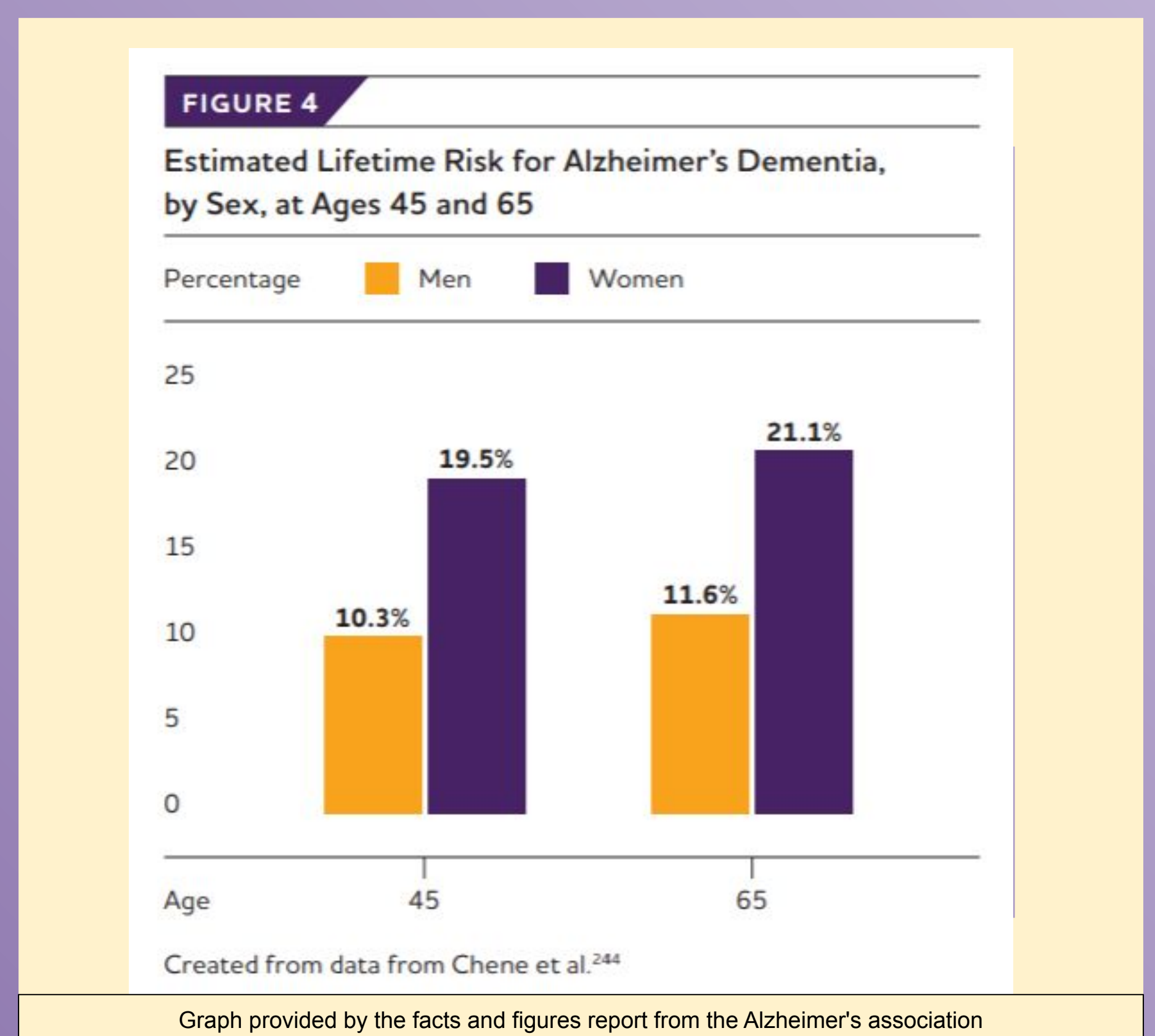
The Mediterranean diet is high intakes of fish, vegetables, legume, fruits, cereals, and unsaturated fats.

- Experiments have proven that Mediterranean diet decreases risk for adults to develop dementia.
- A study of 2,258 New Yorkers, with no dementia, did the Mediterranean diet over 4 years showed a lower chance of getting Alzheimer's disease.
- Similar results when patients were switched to people with Mild Cognitive Impairment (MCI)
- A meta-analysis in 2016 compiled together results of 5 studies done on the Mediterranean diet and cognitive ability. Results showed a 27% decrease in risk of MCI and 36% reduction in Alzheimer's.

The DASH diet increases intake of fruits, vegetables, and whole grain foods and decreases an individual's dairy, meat, sodium and alcohol.

- The Memory and Aging Project shows decrease of risk in cognitive impairment with DASH diet
- The ENCORE study showed similar results with 144 high blood pressure obese adults
 - Some were instructed to exercise or lower calorie intake with diet over 4 months
 - Cognitive ability improved in all participants, with the best results in exercise group

Overall, the field of cognitive impairment and how our lifestyle effects it is still lacking in knowledge needed to further expand on the topic. I wish to contribute to the field and broaden the knowledge for this subject.



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