Acarbose ameliorates western diet-induced metabolic and cognitive impairments in the 3xTg mouse model of Alzheimer’s disease

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Introduction

- Alzheimer’s disease (AD), a neurodegenerative disease in which patients exhibit impaired memory, motor function, and language due to neuronal damage, is rapidly growing in prevalence as the population ages.
- AD is a disease of aging, and other diseases of aging including diabetes and obesity are risk factors for AD.
- As such, geroprotection interventions may be of use in the prevention and treatment of AD.
- Here, we report our investigation into the effects of acarbose, a geroprotector used to treat type 2 diabetes, on cognition and disease pathology in the 3xTg AD mouse model of AD in the presence or absence of a western diet.

Methods

- Western diet exacerbated cognitive deficit which is ameliorated by acarbose.
- Western diet led to metabolic impairments and exacerbated AD pathology in the 3xTg mouse model of AD.
  - Increased body and fat mass
  - Decreased energy expenditure
  - Reduced glucose tolerance in female mice
  - Increased Iba1, p-tau, and APP levels
  - Significant cognitive impairments

Conclusions

- Acarbose ameliorated many of the Western diet-induced impairments, including:
  - Body and fat mass
  - Energy expenditure
  - Glucose tolerance
  - Start and APP levels
  - Cognitive deficits

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