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Arachidonic acid supplementation to improve cognitive impairment of schizophrenia

Submission date	Recruitment status	[ ] Prospectively registered
04/07/2024	No longer recruiting	[ ] Protocol
Registration date	**Overall study status**	[ ] Statistical analysis plan
05/07/2024	Completed	[ ] Results
Last Edited	**Condition category**	[ ] Individual participant data
29/08/2024	Mental and Behavioural Disorders	[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Cognitive impairment associated with schizophrenia (CIAS) is characterized by a broad pattern of cognitive deficits ranging from attention and working memory to social cognition and language. Currently, the main antipsychotic maintenance treatment has a limited substantial effect on improving cognitive performance and barely makes a full recovery in socialization. In the brain, arachidonic acid (AA) is mainly esterified into lipids, serving as cellular membrane components for the dynamic morphological change of neuron cells and signaling molecules during neurotransmission.
Given the multi-involvements of AA in brain development and neuronal activities, this study aims to investigate the efficacy of AA supplementation in improving cognitive function among SZ patients and to elucidate the underlying mechanisms, thereby offering new perspectives and strategies for the treatment of cognitive impairments.

Who can participate?
Patients with SZ and healthy participants registered at the Suzhou Guangji Hospital, Jiangsu Province, China.

What does the study involve?
Patients and healthy participants are randomly assigned to powdered FA supplements containing AA or the AA-free placebo once daily for nutraceutical supplementation.
The niacin skin flushing response, and cognition performance are assessed by trained psychiatrists at the beginning, midpoint, and endpoint. Blood samples are taken at the beginning and endpoint.

What are the possible benefits and risks of participating?
Participants who receive the AA may benefit from improved cognitive performance. There are no known risks involved with participating.

Where is the study run from?
1. Shanghai Jiao Tong University (China)
2. Suzhou Guangji Hospital, Jiangsu Province (China)

When is the study starting and how long is it expected to run for?
November 2020 to December 2024

Who is funding the study?
National Natural Science Foundation of China
Interdisciplinary Program of Shanghai Jiao Tong University (China)

Who is the main contact?
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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
Nil known

Study information

Scientific Title
Exploring the impact and underlying mechanisms of arachidonic acid supplementation on cognitive impairment in schizophrenia: a double-blinded, placebo-controlled, randomized study

Study objectives
This study aims to evaluate the therapeutic effects and underlying mechanisms of arachidonic acid supplementation on cognitive improvement.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 06/11/2020, Research Ethics Committee of Bio-X Institutes, Shanghai Jiao Tong University (No. 1954 Huashan Road, Xuhui District, Shanghai City, Shanghai, 200030, China; +86 21-62932151; bio-x@sjtu.edu.cn), ref: No. M202006

Study design
Single-center interventional double-blinded randomized placebo-controlled trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Treatment

Participant information sheet
Not available in web format, please use contact details to request a participant information sheet.

Health condition(s) or problem(s) studied
Schizophrenia

Interventions
This was designed for a double-blinded, placebo-controlled, randomized clinical trial (RCT) of oral arachidonic acid (AA) supplementation to identify whether the adjunctive intervention can improve cognitive performance in schizophrenia and healthy controls.

Patients were recruited and randomly assigned to powdered FA supplements containing 338 mg AA or the AA-free placebo once daily for a six-week adjunctive intervention.

The AA supplements and the placebo were identical in powder particle size, color, volume, and packaging. The diet of inpatients remains consistent during their hospital stay.

Healthy volunteers were recruited to FA supplements containing 1400 mg AA for an eight-week intervention and four-week wash-out period.

Stratified randomisation based on patient gender, age, height, weight, and cognitive performance measured by CANTAB system. We are utilizing an online tool for this process, which ensures that each stratum is randomly assigned participants.

Intervention Type
Supplement

Primary outcome measure
Cognitive function was measured using the Cambridge Neuropsychological Test Automated Battery® (CANTAB®) system at baseline, week 3, and 6

Secondary outcome measures
1. RBC's lipids and fatty acids were measured using gas chromatography-mass spectrometry at baseline and week 6
2. Mitochondria lipids measured using ultrahigh-performance liquid chromatography quadrupole orbitrap mass spectrometry at baseline and endpoint
3. RNA sequencing of white blood cells was conducted at baseline and endpoint
4. Niacin skin flushing response test using 6 concentrations (triple gradient dilution from 60 mM) of niacin dropped onto the skin at baseline, week 3, and 6

Overall study start date
02/11/2020

Completion date
31/12/2024

Eligibility

Key inclusion criteria
1. Patients of SZ were diagnosed according to the International Classification of Diseases 10th edition (ICD-10)
2. The patient's family members or legal guardians fully understood the content of this study and signed informed consent

Participant type(s)
Healthy volunteer, Patient

Age group
Adult

Lower age limit
18 Years

Upper age limit
75 Years

Sex
Both

Target number of participants
80 = 40 in AA group and 40 in AA-free placebo group

Total final enrolment
62

Key exclusion criteria
1. Patients should not have a history of other mental disorders, neurological disorders, serious physical diseases, traumatic brain injury, substance abuse, or dependence
2. Healthy controls should not have any current or previous psychiatric history or family history, as assessed by the Mini-International Neuropsychiatric Interview (M.I.N.I.)

Date of first enrolment
08/11/2020

Date of final enrolment
22/02/2021

Locations

Countries of recruitment
China

Study participating centre
Suzhou Guangji Hospital
No. 11 Guangqian Street, Xiangcheng District, Suzhou City
Jiangsu Province
China
215131

Sponsor information

Organisation
National Natural Science Foundation of China

Sponsor details
No. 83 Shuangqing Road, Haidian District
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Sponsor type
Government

Website
https://www.nsfc.gov.cn/english/site_1/index.html

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https://ror.org/01h0zpd94

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Sponsor type
University/education

Website
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ROR
https://ror.org/0220qvk04

Funder(s)

Funder type
Government

Funder Name
National Natural Science Foundation of China

Alternative Name(s)
Chinese National Science Foundation, Natural Science Foundation of China, National Science Foundation of China, NNSF of China, NSF of China, , National Nature Science Foundation of China, Guójiā Zìrán Kēxué Jījīn Wěiyuánhuì, NSFC, NNSF, NNSFC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
China

Funder Name
Shanghai Jiao Tong University

Alternative Name(s)
, , Nanyang Public School, Nan Yang College of Chiao Tung, National Chiao Tung University, Jiao Tong University, SJTU

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
China

Results and Publications

Publication and dissemination plan
Planned publication in a high-impact peer-reviewed journal

Intention to publish date
31/12/2025

Individual participant data (IPD) sharing plan
The datasets generated and/or analysed during the current study will be published as a supplement to the results publication.

IPD sharing plan summary
Published as a supplement to the results publication