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The Imperial College comprehensive study of people with chronic damage to small blood vessels in the brain to define underlying mechanisms

Submission date
22/02/2026

Recruitment status
Recruiting

Registration date
13/04/2026

Overall study status
Ongoing

Last Edited
03/03/2026

Condition category
Circulatory System

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
We can see the effects of chronic changes to the blood vessels deep inside the brain on a brain scan as people get older. This is called small vessel disease but is present in the majority of older people and is often a feature just of ageing. However, when these changes become more severe, they are one of the commonest reasons people have strokes, bleeds in the brain or develop dementia. However, we currently can't treat these changes as we don't fully understand why this happens or what medications to use. This is partly because these changes vary a lot from one person to another and we don't have good ways of measuring what is wrong with the blood vessels.
This research study aims to improve our understanding of cerebral small vessel disease to identify new ways to treat it. In particular, we aim to include a much broader range of people with small vessel disease than in previous studies and do more detailed measurements of how their blood vessels work and how the condition affects them and then continue to keep in touch with people to understand what medical difficulties they develop in the future.

Who can participate?
Any adult who has had a brain scan at one of the Imperial College Healthcare NHS Trust hospitals that shows changes consistent with these changes in small blood vessels in the brain, as occurs in most people with age, and who lives in North-West London. People with an alternative cause of similar changes (e.g., multiple sclerosis or major brain injury), a diagnosis of dementia or who are fully dependent on others for their personal care aren't eligible.

What does the study involve?
Participants provide permission for the research team to review their medical records when recruited and in the future; to be interviewed regarding their medical history, family history and lifestyle; and to have tests of their thinking. These are either carried out by telephone or, in a subgroup of participants with more significant changes on their brain scan, during a 2-hour in-person visit. The in-person visits will also include physical tests of mobility, tests of blood flow to

the brain with an ultrasound scanner and research blood tests. Tests are then repeated at 1 and 5 years.

What are the possible benefits and risks of participating?
The tests are all safe, with no significant risks of participation. One test of blood flow to the brain (cerebrovascular reactivity) involves breathing air mixed with a low dose of carbon dioxide, similar to the air breathed out. This is safe, but in a few people it can cause a sensation of breathlessness.
Participating in the study can be beneficial due to the additional reviews carried out by research staff, which can identify medical problems that need addressing, but the study isn't designed for this purpose.

Where is the study run from?
Imperial College London (UK)

When is the study starting and how long is it expected to run for?
January 2025 to April 2040

Who is funding the study?
The study is funded by the Stroke Association (UK), by philanthropic donations and by Imperial College London (UK)

Who is the main contact?
Prof. Alastair Webb, alastair.webb@imperial.ac.uk

Contact information

Type(s)
Principal investigator, Public, Scientific

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Integrated Research Application System (IRAS)
342919

Study information

Scientific Title
An all-inclusive cohort for the comprehensive examination of sporadic small vessel disease

Acronym
ACCESS@ICL

Study objectives
We will establish an all-inclusive cohort of participants with imaging features of cSVD, including a deeply phenotyped cohort with moderately-severe SVD cohort representative of the full spectrum of the disease. This will principally answer the questions:
1. What are the physiological mechanisms underlying the range of clinical and imaging manifestations of cerebral small vessel disease?
2. Are there distinct patterns of cerebral small vessel disease reflecting different underlying mechanisms of the disease?

The secondary questions of the study are:
1. How do people with different clinical, imaging and physiological manifestations of the disease differ in how they progress over time, particularly in their risk of stroke and dementia?
2. Can we identify better methods to measure the clinical problems the disease causes (i.e., cognitive or mobility difficulties)?
3. Can we identify better methods to measure the underlying mechanisms that cause the disease, that can be used to measure the future response to treatment?

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 04/12/2024, East of England - Essex Research Ethics Committee (2 Redman Place, London, EC20 1JQ, United Kingdom; -; Essex.REC@hra.nhs.uk), ref: 24/EE/0188

Primary study design
Observational

Secondary study design
Longitudinal study

Study type(s)

Health condition(s) or problem(s) studied
Cerebral small vessel disease

Interventions
The study is a prospective hospital based cohort including all consenting patients with imaging manifestations of cSVD. Any patient with evident imaging changes will be included in the overall cohort, including a limited remote assessment by telephone or video, imaging review and a review of medical records. Participants will provide remote consent without a need for a face-to-face appointment to maximise inclusion in the study.

Within the overall cohort, participants with moderate to severe imaging manifestations of cerebral small vessel disease occurring at a younger than expected age will be invited to participate in the deeply phenotyped cohort to determine the clinical-imaging-pathophysiological correlations in cSVD. Consenting participants will have a comprehensive face-to-face assessment to quantify their disease in multiple domains: clinical assessment/history; cognition; function and mobility; imaging; cardiovascular physiology; fluid biomarkers and genetics. This detailed phenotyping will provide the first study with detailed data within each of these domains, particularly the physiological assessment, to differentiate patterns of disease and how these patterns relate to dysfunction within each domain. Participants will be prospectively followed face-to-face for up to 5 years to assess for clinical progression, with ongoing follow-up after this stage by healthcare record linkage.

The study will reduce the ascertainment bias present in previous studies of cSVD by targeting imaging defined disease including all major imaging manifestations and regardless of the mode of presentation to medical services. However, there will still be a significant risk of ascertainment bias due to imbalance in modes of presentation and rates of recruitment via each pathway. The full cohort will therefore be nested within a broader registry of all patients with SVD, linked to an anonymised registry of all patients presenting to Imperial College NHS Hospitals Trust and undergoing an MRI scan with any markers of cSVD identified in the clinical report. This will enable determination of the rate and impact of ascertainment bias and to determine the background prevalence of imaging manifestations.

Intervention Type
Other

Primary outcome(s)
1. Dementia or dependency measured using observation at up to 5 years

Key secondary outcome(s))
1. Physiological haemodynamics measured using transcranial ultrasound at 1 year

Completion date
01/04/2040

Eligibility

Key inclusion criteria
1. 1 or more acute or chronic lacunar strokes
2. ‘Non-negligible’ white matter hyperintensities:
2.1. Fazekas score ≥2 at any age or ≥1 below the age of 50 years, with definite white matter hyperintensities confirmed by review of imaging
2.2. Modified Blennow score of ≥2 at any age or ≥1 below the age of 50 (on CT)
3. At least two microbleeds
4. Previous intracerebral haemorrhage not due to a secondary cause (arteriovenous malformation [AVM], aneurysm, tumour etc) after complete investigation, or evidence of previous asymptomatic haemorrhage (i.e., superficial siderosis)
5. >5 dilated perivascular spaces
6. Willing to provide consent, or assent from next of kin or legal representative for participants who do not have capacity to consent
7. Resident in the area of the North West London ICS or registered with a GP within the ICS
8. Aged 18-120 years

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 years

Upper age limit
120 years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Confounding conditions on imaging: multiple sclerosis; significant regions of gliosis (eg prior trauma); brain tumour with potential to cause oedema; symptomatic territorial infarct; leukodystrophy.
2. Monogenic cause of cerebral small vessel disease (cSVD) defined by positive gene test, pathognomic imaging features (temporal pole white matter change) or strongly suggestive family history of probable autosomal dominant inheritance affecting 2 1st degree relatives with onset before 50 years.
3. Alternative causes of incident stroke where the stroke results in significant disability (modified Rankin scale [mRS] >2): critical steno-occlusive cerebrovascular disease (>70% in end vessel) in territory of incident, disabling stroke; dissection; vasculitis; causative carotid web etc;. Participants with atrial fibrillation with an embolic stroke can be included if there is no associated symptomatic territorial infarct.
4. Already dependent for personal activities of daily living (ADLs) prior to admission to hospital.
5. Diagnosis of dementia at identification.
6. Women who are currently pregnant at time of recruitment (but may be recruited after delivery). If a woman becomes pregnant during the study they will remain in the study but no study specific procedures will be performed.

Date of first enrolment
03/01/2025

Date of final enrolment
01/04/2035

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Imperial College Healthcare NHS Trust
The Bays
St Marys Hospital
South Wharf Road
London
England
W2 1BL

Sponsor information

Organisation
Imperial College London

ROR
https://ror.org/041kmwe10

Funder(s)

Funder type

Funder Name
Stroke Association

Alternative Name(s)
TheStrokeAssociation, TheStrokeAssoc

Funding Body Type
Private sector organisation

Funding Body Subtype
Associations and societies (private and public)

Location
United Kingdom

Funder Name
Imperial College London

Alternative Name(s)

Imperial College of Science, Technology and Medicine, Imperial College London, UK, Imperial College London, London, England, Imperial College London in United Kingdom, imperialcollege, ICL

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available