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Investigating the neuropathology of obstructive sleep apnoea

Submission date
03/10/2016

Recruitment status
No longer recruiting

Registration date
30/01/2017

Overall study status
Completed

Last Edited
25/06/2021

Condition category
Respiratory

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

Plain English summary of protocol

Background and study aims
Obstructive sleep apnoea (OSA) is a common condition in which the upper airways (wind pipe) collapse repeatedly during sleep, stopping the flow of air into the lungs. This prevents the sufferer from being able to breathe properly while they are asleep, causing excessive sleepiness throughout their waking hours. OSA is usually treated using a continuous positive airway pressure (CPAP) machine. This involves the patient wearing a face mask during sleep which is connected to the machine which supplies a constant steam of air to help keep the airways open. Previous research has shown that the low blood oxygen levels affect thinking and feeling, and in some cases it may damage the brain cells involved with memory, attention, emotions and decision-making (cognitive function). The aim of this study is to investigate the relationship between the amount of oxygen in the blood and the loss (if any) of brain cells, as well as how the ability to perform complex tasks is affected in patients that suffer from sleep apnoea.

Who can participate?
Adult men with untreated mild OSA who are experience excessive sleepiness.

What does the study involve?
At the start of the study, participants are interviewed, provide blood and saliva samples, have their cognitive function tested and have two MRI brain scans and two PET-MR brain scans. The MMRI scan involves going into an MRI scanner (large tube) which uses strong magnetic fields and radiowaves to see the activity in the brain. The PET-MR scan is a MRI scanning is combined with another type of scanning called PET, which involves the injection of a radioactive tracer into the body which is picked up in the scan. Participants then return three months later after having been treated with CPAP as part of their normal care. At the three months visit, the initial tests are repeated in order to find out if the CPAP has caused any structural changes in the brain or affected cognitive function.

What are the possible benefits and risks of participating?
There are no direct benefits of taking part, however some participants may find taking part in research rewarding, as they will be contributing to the development of medical knowledge that may benefit other people in the future. The main disadvantage of taking part in this study is the extra time taken to attend the hospital for the tests. Participants will be assisted with travel

arrangements to attend the tests. Some private medical insurers require to be notified of participation in research studies.
The interview involves discussing personal information and experiences that some people may find distressing. Participants will be informed that if they feel uncomfortable with any of the questions they do not have to answer them. Blood sampling can cause some discomfort, and there is a possibility that a small bruise may develop. In addition, participants may find the MRI scan to be claustrophobic or anxiety-causing and the PET scan to be uncomfortable as it involves a line being placed in a vein, which can cause pain, bruising and infection.

Where is the study run from?
Nuffield House Sleep Centre (UK)

When is the study starting and how long is it expected to run for?
June 2016 to October 2020

Who is funding the study?
Wellcome Trust (UK)

Who is the main contact?
Dr Nadia Gildeh
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Contact information

Type(s)
Scientific

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Additional identifiers

Protocol serial number
31311

Study information

Scientific Title
Investigating the Neuropathology of Obstructive Sleep Apnoea (INcOSA)

Acronym
INcOSA

Study objectives
The aim of this study is to investigate:
1. How low blood oxygen levels affect brain cells, and how this affects the ability to perform memory tasks
2. Whether impairments in brain functioning can be reversed if the breathing difficulties are treated with continuous positive airway pressure (CPAP)

Ethics approval required
Old ethics approval format

Ethics approval(s)
London-Camberwell St Giles Research Ethics Committee, 14/07/2016, ref: 16/LO/0893

Study design
Observational; Design type: Cohort

Primary study design
Observational

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Sleep apnoea

Interventions
The total duration of participants in this research study will be 4 months. Participants will be recruited from sleep clinics at the Sleep Disorder's Centre, Guy's Hospital. Participants will have an initial interview and discussion regarding the study to assess whether they would like to take part. As part of usual practice they will have an initial medical assessment and examination.

In the first study visit, participants will undergo an overnight study as part of usual practice to assess the level of sleep apnoea and rule out any other sleep disorders. Following this, if a participant meets the criteria for the study a discussion and written consent will be taken formally for participation in the study. Participants will also be asked to provide a blood or saliva sample and complete some short questionnaires. Cognitive testing will then be performed and will last roughly 2 hours, after which particpants will be transported to another site (King's College London, Centre for Neuroimaging Sciences) for an MRI brain scan (lasting roughly 1 hour).

At a second visit, a PET-MRI scan will be performed (Guy's ad St Thomas' Hospital Trust) within 2 weeks of the initial assessment and overnight study/MRI scan. This will last approximately 1.5 hours.

Participants will then started on CPAP treatment for OSA as per usual clinical practice. This will be done within usual NHS wait times and there will not be any delay. Participants will receive follow up phone calls to ensure any issues are dealt with.

After 3 months of CPAP therapy participants will have a further overnight study to ensure treatment is adequate as part of standard care and following this will have a repeat MRI and PET scan, blood/saliva samples taken as well as cognitive testing. We will attempt to ensure this occurs in as few visits as possible and within 2 weeks of the overnight study.

Following the repeat studies after 3 months of treatment management will be taken over solely by the clinical sleep team with opportunity for a full debrief after the participants final visit. A letter will be sent within 2 weeks of the final visit thanking participants for their time and offering opportunity for further questions to be answered. No individual results will be produced due to anonymisation, however group results will be offered when analysis is complete. Travel and reasonable costs as well as compensation for time given will be provided.

Intervention Type
Other

Primary outcome(s)
Levels of neuroinflammation and discrete changes in brain morphology, physiology and cognition will be measured via MRI, PET-MRI imaging and cognitive testing (CANTAB battery) at baseline and after 3 months of CPAP treatment.

Key secondary outcome(s))
Genetic analysis and linkage to clinical and neuroimaging data will be measured using biological samples (blood or saliva) which will be analysed and stored in the BioResource for Mental and Neurological Health at baseline and 3 months after CPAP treatment.

Completion date
01/10/2020

Eligibility

Key inclusion criteria

1. Male patients
2. Untreated mild OSA (AHI>5events/hour and <10) or severe OSA (AHI>30events/hour)
3. Excessive sleepiness (ESS>9)
4. Aged 18- 65 years

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Upper age limit
65 years

Sex
Male

Key exclusion criteria
1. Female patients
2. Patients with other sleep disorders
3. Current or past neurological or psychiatric disease
4. Undertaking neuropharmacological treatment
5. History of alcohol or recreational drug abuse
6. Major organ failure
7. Professional drivers/shift workers
8. Unable to have MRI scan (e.g. too heavy (>200Kg) or who have ferromagnetic implants)
9. Inability to comprehend what is proposed
10. Inability to travel to the research sites

Date of first enrolment
27/09/2016

Date of final enrolment
01/04/2020

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Nuffield House Sleep Centre
Guy's Hospital
Great Maze Pond
London
United Kingdom
SE1 9RT

Sponsor information

Organisation
King's College London

ROR
https://ror.org/0220mzb33

Funder(s)

Funder type
Charity

Funder Name
Wellcome Trust

Alternative Name(s)

Funding Body Type
Private sector organisation

Funding Body Subtype
International organizations

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and/or analysed during the current study during this study will be included in the subsequent results publication.

IPD sharing plan summary

Other

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
HRA research summary			28/06/2023	No	No