Newsletter

Issue 7, Summer 2019

Wildflower meadow at the Warneford Hospital — Photo credit: Amy Chinner

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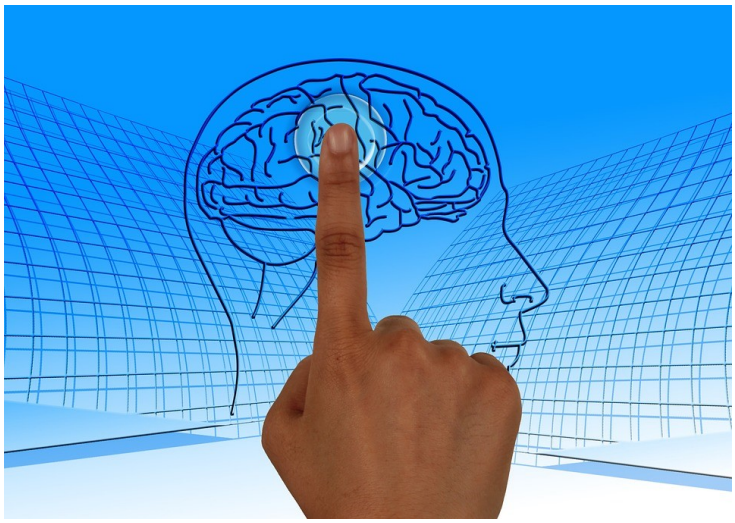
News LATE Dementia - *a new dementia diagnosis*



Alzheimer's disease accounts for 60-70% of cases of dementia, but researchers have long suspected that there are in fact many more forms of dementia, and sub-types of Alzheimer's disease, than are currently known about.

In an exciting development, an international panel of experts announced the discovery of a new form of dementia: limbic-predominant age-related TDP-43 encephalopathy, aka LATE. In the April issue of *Brain*, they described how LATE mainly affects people older than 80, and may account for about 17% of all cases of dementia.

Professor Nelson (University of Kentucky), who co-authored the report, explained that "although people with LATE had some of the hallmark symptoms of Alzheimer's disease, such as memory and thinking problems, their brains did not show signs of the (Alzheimer's) disease at autopsy". A key difference with LATE is dysfunction in a protein called TDP-43, which helps to control gene expression in the brain. Misfolded TDP-43 can cause severe shrinkage in the hippocampus (the brain area critical for memory). Unfortunately changes in this protein cannot currently be detected in the brain whilst the person is still living.

According to Professor Nelson, one of the most important goals now is to find "biomarkers" for LATE – measurable signs of the disease process, for example protein changes in blood tests, or abnormalities on brain scans. If researchers can find these biomarkers, the disease can be better understood, people can receive more accurate diagnoses, and we can potentially develop treatments for it.

Until that day comes, however, people who most likely have LATE will still benefit from receiving an Alzheimer's diagnosis, and taking medications for Alzheimer's disease. This is because currently Alzheimer's medications target generic dementia symptoms (like memory problems), rather than the underlying disease process. A number of trials are underway to try and investigate drugs targeting the underlying LATE disease process. Maintaining a healthy lifestyle is also likely to be beneficial for preventing all types of dementia.

Article credit: Sophie Walker

News All about research analysis!

Patient and public involvement (PPI) leads from Oxford University's health research departments spent a great morning last month talking about research analysis with a group of patient, carer and public members.

We were joined by Dr Sana Suri, Alzheimer's Society Research Fellow, who talked the group through research analysis and critical thinking concepts. Such as selection bias—how the method for choosing research participants can alter the research findings—and, therefore, how important it is to minimise selection bias though randomisation (using chance to select participants for research, or to allocate them to different groups within the study). Sana also introduced the group to Zooniverse, a website for 'people powered research' that enables anyone to contribute to real research – including areas of medicine, social science and nature.

We really enjoyed the opportunity to share a researcher's perspective with the group and discuss the challenges of designing robust research. Feedback from the workshop participants included: "excellent, provoked very good conversations & understanding" and "feel I learnt a lot from this workshop".

You can find out about future sessions for patient, carer and public members on understanding research by visiting the Working Together event page. Article credit: Clare Murray

News EPAD study: General Assembly in Geneva

Members of the European Prevention of Alzheimer's Dementia (EPAD) study consortium met in May for the 5th General Assembly, kindly hosted this year by The Centre de la Mémoire of the Geneva University Hospital and University of Geneva. The annual gathering provided an opportunity for over 200 people involved in EPAD, from institutes and organisations across Europe, to come together and share their experiences so far. There was reflection on the achievements of the study so far, as well as discussions about lessons learnt along the way and what EPAD's future will look like.

News

For the future-minded there was a strong focus on the upcoming “Proof of Concept” (PoC) interventional trials; which will recruit eligible participants from the ongoing EPAD Longitudinal Cohort Study. The importance of this ground-breaking study was reflected upon in a poignant presentation by some of the members of the EPAD participant panel. Every individual is part of a bigger picture and is playing an active role in finding an intervention which will change how we tackle Alzheimer's Disease in the coming years.

Article credit: Nyla Haque

Researcher Profiles

In this section of the newsletter, we get to know the OxDARE scientists behind the research.

Leona Wolters

OxDARE Research Assistant

Department of Psychiatry, University of Oxford

Q. What are your main research interests?

Leona: I currently work on studies that focus on the prevention of Alzheimer’s Dementia. We collect a lot of data on healthy people, and people who recently started to experience some difficulties with their memory. I’m hoping that our research will continue to lead to a better understanding, and to the development of new treatments, very soon!

Tony: My early research focused on neuroimaging, depression and Alzheimer’s but since moving to Oxford my interest has moved onto how Big Data can help dementia. I am currently involved in the setup of multiple studies at the department looking at collecting data that will add to our understanding of dementia.

Q. Why did you decide to get involved in ageing and dementia research?

Tony: My grandfather suffered from Alzheimer’s. He passed away when I was 9 but it wasn’t until learning more about the disease from professors at university did I find myself pouring over all the information I could regarding it. Nostalgic memories of my grandfather tend to guide my decisions I make when thinking about my career in dementia.

Leona: My first job after finishing my Masters in Clinical Psychology was as an Assistant Psychologist in a memory clinic. Unfortunately, there wasn't much we could offer our patients after they'd received a diagnosis. When I decided to take a break from clinical work to get a better understanding of how research works, it was very clear to me that this is the research area to be involved in.

Q. What is your favourite activity to do in Oxford, during your free time?

Leona: I should probably promote something related to a healthy lifestyle but to be honest – I love getting ice cream at G&Ds!

Tony: I grew up and lived in London for my entire life, and only just moved to Oxford at the beginning of the year. Leaving the cacophony of sounds that is London to the peace and tranquillity of Oxford has been a real treat. To take full advantage while I'm here, I to tend to go on various hikes and I run every evening after work to clear my head. Oxford has absolutely stunning scenery and I don't mind getting lost (which has happened a few times already!)

Q. Do you have any recommendations for a book/ movie/ holiday?

Leona: I've recently read "This is going to hurt: Secret Diaries of a Junior Doctor" by Adam Kay – it's an excellent book! With wit and humour it highlights medical staffs' hard work and their great dedication towards their patients, and the NHS, despite incredibly difficult working conditions and long hours.

Tony: I read Still Alice by Lisa Genova shortly after my grandfather passed away and it completely changed my outlook about ageing and his life. It was adapted recently into a highly successful and brilliant movie. If you haven't read the book or seen the movie, I would highly recommend both. Also if you want something not related to Alzheimer's my favourite movie of all time is 12 Angry Men.

Tony Thayanandan

Dementia Trials Coordinator

Department of Psychiatry, University of Oxford

Research GameChanger: Smartphones & Preclinical Dementia

Early signs of Alzheimer's disease can appear more than 10 years before an individual is diagnosed, but detecting these small changes is difficult. Improving how we recognise the initial stages of this disease is crucial to the advancement of research that will prevent, slow down, or even treat the condition. Researchers are now exploring how increasingly prevalent technologies, such as smartphones, can help.

Smartphones are pocket-sized computers, capable of recording small differences in thinking, memory and speech using in-built sensors. By allowing individuals to contribute data from the comfort of their own home, smartphones allow us to measure people's thinking abilities 'little and often', providing a more accurate representation than possible through infrequent clinic appointments.

The GameChanger study, led by the University of Oxford and supported by Alzheimer's Society, investigates how healthy ageing affects performance on smartphone tasks of memory and thinking, deployed within the Mezurio app. Volunteers who don't currently have dementia are asked to complete short tasks on their smartphone every day for a month. Early support for the use of these innovative smartphone cognitive assessments was obtained in a sub-study of the **PREVENT** project conducted in Oxford (results presented here: https://www.biorxiv.org/content/10.1101/599175v1).

Since launch, more than 16,000 people aged 18-92 years, from across the UK, have contributed to the GameChanger study. Data collected from this project will provide an important baseline to help spot the first signs of dementia in the future. Additionally, GameChanger will allow us to better understand how technology can help monitor thinking patterns across a wider UK population than previously explored. GameChanger was presented at this year's Alzheimer's Society Annual Conference by Dr Claire Lancaster in a session exploring the potentials for everyday tech to support better dementia care.

If you would like to participate in the GameChanger Study, please visit the website to find out more: **www.joingamechanger.org**

Article credit: Dr Claire Lancaster

Research Investigating Magnetic Fields in the Brain

The brain uses electricity to communicate between neurons, and this electrical activity creates a magnetic field. The magnetic field created by a single neuron is too small to detect but, when thousands of neurons synchronise, their combined magnetic fields are large enough to be detected from outside the head with specific machines called Magnetoencephalography (MEG) scanners. It is thought that this synchronisation ensures efficient and coordinated communication between neurons.

Research suggests that this neuronal synchronisation might be affected in the earliest stages of dementia, prior to any cognitive symptoms. It is important to measure these subtle, early changes as this is likely to be the period in which interventions are the most effective. MEG scanning offers the potential to sensitively identify, and track, when neuronal communication first starts to become less efficient.

A MEG scanner typically contains around 300 sensors which can take up to one thousand measurements every second. These recordings are completely passive; the sensors simply 'listen' to naturally occurring changes in magnetic field in the brain over time. As the magnetic fields change instantly when neuronal communication changes, MEG scanners can sensitively measure brain activity in real-time. MEG scanning is becoming a more prominent part of research into neurodegeneration and dementia, see the NTAD study below for one current opportunity.

Article credit: Andrew Quinn

Current Opportunities/ Studies

The New Therapeutics in Alzheimer's Disease Project (NTAD)

NTAD aims to determine early signs of Alzheimer's disease in the brain physiology using psychological tests and brain scans, including Magnetencephalography (MEG) scans. We hope that this novel approach will help aid our understanding of the disease and shed new light on the neurodegeneration that occurs in Alzheimer's.

The study is looking for participants aged 50 to 85 years old who are neurologically healthy, or have a diagnosis of Alzheimer's Disease or Mild Cognitive Impairment (MCI). You will be asked to travel to the Oxford Centre for Human Brain Activity, Warneford Hospital, to undertake the various assessments.

If you are interested in hearing more, or taking part in the study, please contact the team via email: ntad@psych.ox.ac.uk or call: 01865 613126.

Current Opportunities/ Studies

The Global Brain Health Survey

The Lifebrain Consortium has launched The Global Brain Health Survey to learn about people's views on the brain. This is an anonymous online survey which takes approximately 15 minutes to complete. Anyone interested and above 18 years of age can participate. Your responses will help us gain information about public awareness and interest in the brain, and willingness to act to maintain brain health.

Please follow this link to participate in the survey: https://www.lifebrain.uio.no/

Upcoming Events

Oxford University Hospitals Annual Public Meeting

Where: Tingewick Hall, John Radcliffe Hospital, OX3 9DU

When: Tuesday 16th July 2019, 5.30pm—7.30pm

Come and hear about the past year in the life of your local hospitals. Plus: talk on Dementia and Delirium by Professor Sarah Pendlebury.

For more information, contact: caroline.rouse@ouh.nhs.uk

HealthFest 2019

Where: Warneford Hospital, Oxford, OX3 7JX

When: Saturday 14th September 2019, 11am—3pm

The theme for this year's event is 'Living Well Through Activity'. There will be plenty of opportunities to get involved with wellbeing focussed activities, engage with our teams and partners, find out information about services, training and employment options as well as get involved with volunteering.

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