MRC Prion Unit @ UCL and National Prion Clinic

NEWSLETTER

On the 13th Feburary we welcomed 80 visitors to the Institute of Prion Diseases for a day of seminars, tours of the laboratories, demonstrations, small group meetings and a buffet lunch. This Newsletter provides a brief overview of the day for those unable to attend.

Prions and prion diseases an update

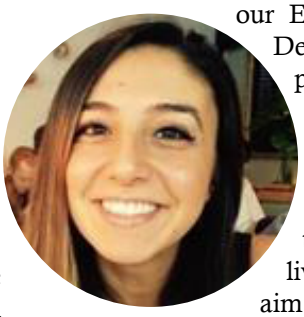
Professor Collinge opened the day by introducing the work of the Unit and the basic biology of prions and prion diseases. Prion diseases are associated with the build up in the brain (and some other organs) of an abnormal or 'rogue' form of a naturally occurring cellular protein, known as the prion protein.The rogue protein results from a change in shape of the normal prion protein. Once formed in the body these rogue proteins recruit and convert more of the normal prion protein into the abnormal form, setting off a kind of chain reaction which leads to a progressive accumulation of the rogue protein. Professor Collinge spoke about the recent discovery by scientists at the Unit of the atomic structure of prion strains and how this knowledge is being taken forward.

Professor Collinge went on to describe the human and animal diseases. Most cases of human prion disease are sporadic, that is, they arise spontaneously for no known reason. Prion disease may also be inherited due to a faulty gene, or rarely acquired by medical procedures. Sporadic and inherited prion disease occurs worldwide in all populations. Sporadic CJD is diagnosed in around 1-2 per million of the population per year resulting in a lifetime risk of 1 in 5000; males and females are equally affected.

On the subject of research to develop treatments for prion diseases, Professor Collinge spoke about our use of PRN100, an engineered antibody that is designed to bind to the normal prion protein and prevent it from changing shape into a pathological form (see here). We treated six patients with PRN100 in 2018 and 2019, with some encouraging results: the treatment appeared to be safe, got into the brain at levels that we expected to be effective, and in one patient who died and had a post mortem examination, the pathology of the disease appeared to be changed by the treatment. Progress with PRN100 has however been stalled because we have been unable to gain the support of a pharmaceutical company or other source of funding for the next steps. Professor Collinge also spoke about some of the strategies that biotechnology companies (eg. IONIS, Sangamo, Gate Biosciences) are exploring to diminish the expression of prion protein as a potential treatment. The drug being developed by IONIS has entered early stage clinical trials.

The EMBED-care programme

Dr Nuriye Kupeli from the Marie Curie Palliative Care Research Department presented work from our Empowering Better End of life Dementia Care (EMBEDCare) programme, a large five year study designed to understand and improve symptoms and concerns of people living with dementia at the end of life and their carers, including those living with prion diseases. The aim of this work is to understand the physical, social, psychological and spiritual needs of people living with sporadic CJD and their families.



We have completed regular assessments with 42 people living with sporadic CJD and their families. The majority of our patient sample were women with an average age of 65 years old and at the time of death were being cared for either in a 24-hour care facility such as a care or at home with formal carers or family providing care. We found that the most commonly reported symptoms were poor mobility, diarrhoea, weakness and drowsiness. Other symptoms that were also reported included agitation, wandering and poor appetite.

We also asked family carers if they thought the symptoms of the person they were caring for were well managed and scores indicated that compared to scores from other groups of people living with dementia (such as Disease), overall, symptoms were managed well and healthcare professionals successfully coordinated their work.

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The National Prion Clinic service and plans for the future

Rachel Williams (Lead Nurse - National Prion Clinic) prepared a presentation focusing on the care aspects of the National Prion Clinic and requesting feedback from our service users for how the service could be improved.

Initially this discussed our care philosophy, the kind of patients we care for, types of reviews on offer and how we integrate clinical practice and research, before focusing on the individual components of our care philosophy. This encompasses, supporting local teams with education and support, psychological support for patient and carer, access to research projects, generation of new knowledge to guide symptom management, clinical assessments, and user feedback.

The presentation also demonstrated geographical data so attendees could visualise how we travel around the UK to support our patients.

The final part of the presentation focused on ideas for the future and asked for feedback on whether these ideas would be helpful.

Areas discussed were: better support for young people affected by prion disease, improving prognosis with research, carer support and communication strategies for behavioural symptoms, and developing resources containing practical tips for carers.

Our evaluation forms had space for people to comment on these ideas, if you did not attend and would like to comment on these ideas please email Rachel.williams36@nhs.net.

Cure CJD Campaign

Nicola Carnie and John Camidge (Chair and Fundraising Lead respectively) of the Cure CJD Campaign provided an overview of the Campaign and new website. They explained the Campaign exists to raise funds to support the work of the Prion Unit in its research to find a treatment for CJD. The Campaign sits under the umbrella of the UCLH (University College London Hospitals) Charity which means any money raised is routed through the UCLH Charity and goes straight into the Campaign fund. All of the Committee members are volunteers and what they do to support the Campaign is done in their spare time.

Delegates attending the Open Day belong to a club that nobody wants to be in; everyone has personal experience of CJD. It was Nicola and John's personal experiences of CJD that led to a lifelong commitment to be involved in the Campaign and do all they can to help support work to find a treatment or cure, and support the Prion Unit. The Campaign started in 2016 with a small group of people personally affected by the disease, aiming to raise £100,000 to support development of PRN100 and bring forward the experimental treatment programme. There is full committee in place now and excitingly in January this year a new website was launched (www.curecjd.org) which provides a new base to work from. The new website contains lots of information and resources to download and use in any fundraising ventures. For any advice on fundraising please email the Campaign via the 'Contact Us' page on the new website.

Nicola thanked everyone who has raised any funds for the Campaign, acknowledging very penny counts. The next target for the Campaign is to raise enough funds to support a clinical trial which will cost in the region of 7 to ten million pounds. Whilst the personal fundraising is likely to continue the Campaign believe that philanthropy represents the most realistic route for reaching this target. The rarity of prion diseases means that to date the Unit has not been able to attract funding from pharmaceutical companies or other investors to advance PRN100 to clinical trials. The Campaign therefore needs to galvanise support in different communities to help fund a clinical trial. Currently some of the Campaign funds go towards supporting the Prion Unit with some of its costs, including funding a Senior Scientist and Technician.

To date the Campaign has raised (over) £900,000. Seeing that figure hit £1 million will be a significant moment and then hopefully millions more will follow.

www.curecjd.org

Small group discussions and tours

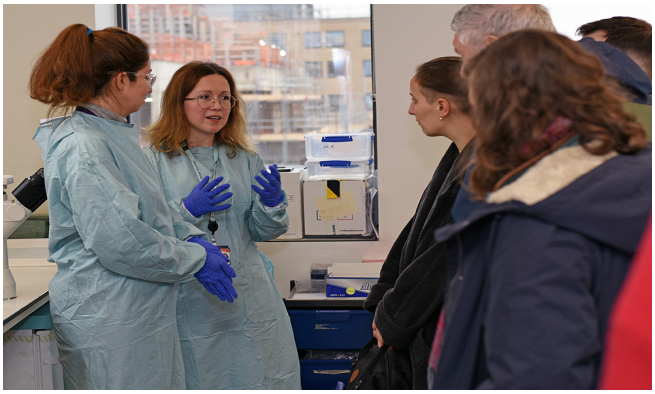
In the "Behavioural disturbance work and carer support" group discussion, Jennifer Foley, neuropsychologist asked: what were the biggest challenges of caring for a loved one with prion disease? Many in the group shared difficulties coping with the frustrating and long journey to diagnosis, often caused by medics' lack of understanding. They talked about the isolating impact of this, as well the general public's lack of understanding.

This isolation was worsened as they became increasingly estranged from their loved one, following sometimes strange changes to behaviour and communication, and were forced to shoulder increased responsibility alone. When asked what would help, the group felt that better education to medics and the public was needed, and better information on how to deal with specific symptoms, such as hallucinations and delusions. They also talked about the importance of reaching out to close friends and the Prion Unit for support, as "you don't have to do it alone". Jennifer and lead nurse, Rachel Williams, hope to develop some better guidance on behavioural changes in order to help support carers more effectively.

Leah Holm-Mercer hosted a group discussion about a new study as part of the National Prion Monitoring Cohort which involves "MEG scans". We hope to use this information to look at how brain activity supports learning and memory changes in early stages of prion diseases. With this information we hope to develop new tools to help us to diagnose prion disease earlier, and to predict timing of disease onset in people who are at risk of prion disease. MEG stands for magnetoencephalography, and is similar to having an EEG brain wave test, but there are many more sensors (nearly 300), and the sensors are sitting inside a helmet rather than being stuck to your head. It measures the magnetic fields produced by your brain's electrical currents. It is non-invasive and completely safe. Whilst you are having the scan you will do a learning task. Leah is recruiting people who have early symptoms of prion disease, have tested positive for a prion protein gene mutation but do not have any symptoms currently and control participants (healthy people who do not have and are not at risk of prion disease). If you are interested in participating please email l.holm-mercer@nhs.net

Simon Mead hosted a group discussion on the development of treatments to cure, halt or slow the progression of CJD and other prion diseases. Further to Professor Collinge's talk in the morning the group discussed the National Prion Clinic's experience of PRN100, including the observations in patients treated, the absence of any significant side effects, the distribution of the drug in the body and brain and the results of post mortem examinations. The group also discussed other experimental compounds in commercial development including "antisense oligonucleotide treatment" being pioneered by a company called IONIS, and "zinc finger transcriptional repression" being pioneered by a company called Sangamo. At the present time we do not have further information about these programmes but remain engaged with their teams.

In addition to the group discussions, the PhD students and senior scientific staff of the Institute of Prion diseases (over 15 volunteers in total) gave group tours around our research facilities showing our specialized laboratories, tissue culture rooms and a robot for automated prion assays. More detailed lab demos were given about the super-resolution microscope, mass spectrometer and other equipment essential to study prion pathology. We got very positive feedback from the participants during the lab demos. The visitors were actively engaged in a dialogue with scientists asking a lot of questions and showing genuine interest in different aspects of prion research work. Flexibility in touring schedule and small size of the groups created a friendly and casual atmosphere fostering more informal discussions.



Feedback

Electronic feedback of the open day was collected this year, enabling us to review the day effectively. The Open Day itself was found useful or very useful to all who attended with many comments wishing us well in research and encouraging our work.

Amongst the feedback were some suggestions to be considered for future events including a more detailed programme in advance, additional time for Q&A, consideration of chat room posted questions, links for detailed scientific literature, improvements to our audio system and some additional dietary options.

We look forward to welcoming you to next year's Open Day.