News from the South Wales MS research team – 2018

Welcome to our second newsletter which includes information about our recently published work as well as studies we're currently working on. This research is based on data and samples from the 'Epidemiology of MS' project and the Welsh Neuroscience Research Tissue Bank (summarised below). Many of you have contributed to these studies, so thank you to all our volunteers.

Epidemiology of MS Project

This ongoing longitudinal study began in 2006. Its aim is to find out how often MS and other neuroinflammatory disorders occur in the population, who is affected, what are the causes, and how we can best treat them. To date over 1850 people are included in the study. The study collects information about participants and their disease e.g. relapses, physical disability and disease-modifying treatments. We do this through specialist MS clinics and annual questionnaires.

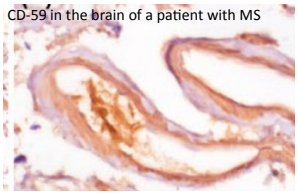
Welsh Neuroscience Research Tissue Bank (WNRTB)

The WNRTB oversees the collection and analysis of samples for the 'Epidemiology of MS' study. Samples include blood, saliva and/or urine. We also obtain samples from healthy volunteers. The samples allow us to analyse DNA and biochemical markers of disease. If you haven't already donated and would like to volunteer please contact wnrtb@cardiff.ac.uk.

Outcomes in people of ethnic minorities with MS (Completed)

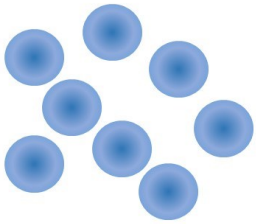
MS is most frequent in Caucasian populations. Data on long-term outcomes in other ethnic groups is limited. We investigated clinical features and time to mild and more severe disability in ethnic minority (EM) patients with MS and made comparisons to a Caucasian cohort from the same UK region. 1949 MS patients (1866 Caucasian, 83 EM) were identified. EM patients were younger at disease onset, and primary progressive MS was less common. Ethnicity was associated with time to lower disability levels, but not with time to higher levels of disability (e.g. needing a stick to walk 100m). EM patients reach early levels of fixed disability more rapidly than Caucasian patients, but this effect diminishes at later stages of disease. This has implications for the clinical management of these patients. See the published research paper at https://tinyurl.com/yau8b8nt.

Levels of CD-59 in cerebrospinal fluid and plasma in people with MS (Completed)



CD-59 is a molecule involved in stopping attacks on the membranes of cells in our body. Little is known about the presence of CD-59 in the brain. We looked at levels of CD-59 in the cerebrospinal fluid (found in the brain and spinal cord) and plasma (part of our blood) in people with MS and other neuroinflammatory disorders. Levels of CD-59 were higher in cerebrospinal fluid compared to plasma. However levels of CD-59 in plasma differentiated people with MS from those people with neuromyelitis optica spectrum disorder (another neuroinflammatory disorder that can present with similar symptoms). It also differentiated people with MS from those who had experienced a clinically isolated syndrome. See the published research paper at https://tinyurl.com/ycfrkela.

Can tiny bubble-like structures help diagnose and monitor MS? (Completed)

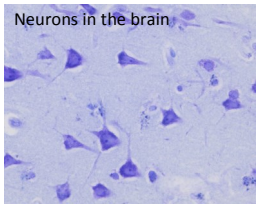


Tiny bubble-like structures, called extracellular vesicles (EVs), are released in the body by all our cells. They can be detected in body fluids such as blood and cerebrospinal fluid, and can tell us information about the state of the cells and organs they came from. Dr Jo Welton (Cardiff Metropolitan University) has developed a novel protocol to enable investigation of EVs in cerebrospinal fluid. It was tested using samples from the Welsh Neuroscience Research Tissue Bank. Dr Welton demonstrated that is was possible to use EVs in cerebrospinal fluid derived from patients with MS and controls, to carry out a detailed analysis of their biochemical make-up. This technique could offer opportunities to identify new markers of inflammatory diseases and potential targets for treatment. See the published research paper at https://tinyurl.com/y9nkrfz7.

MS severity genes: explaining variation in MS to identify protective mechanisms (In progress)

Predicting the future in MS is difficult due to our limited understanding of what controls disease severity. It is likely to be determined by a combination of genetic and environmental factors. Our aim is to identify 'MS severity genes', by reading the genetic code of people with MS, and linking it to measures of disease severity, such as disability level. Our study will also look at a range of environmental factors to identify those that make MS better or worse (e.g. smoking). Identifying genetic and environmental factors linked to disease severity will inform patients to make lifestyle decisions that minimise the impact of MS, and help the search for new treatments.

Complement pathway activation and dysregulation in progressive MS (Completed)



The complement system refers to a series of >20 proteins (biochemical compounds), circulating in the blood and tissue fluids. Most of the proteins are normally inactive, but during some diseases can become sequentially activated in a cascade. We investigated the localisation of i) complement pathway proteins and ii) regulators of complement proteins, in the cortical grey matter and subcortical white matter of the brain in people with progressive MS. We found that complement proteins and their regulators were increased in brain lesions within the white matter. In contrast, complement proteins were increased in brain grey matter lesions but their regulators were reduced. Our work confirms that complement activation and dysregulation occurs in all cases of progressive MS and suggests that the complement system may provide a marker of how MS will behave in the future. It may also be a potential target for treatment. See the published research paper at https://tinyurl.com/y7fdz6gc .

The clinical, social and economic impact of relapses in MS (In progress)

Relapses are the central clinical feature of MS, but the relationship between relapses and long-term disability remains unclear. Disease-modifying therapies (DMTs) have been shown to significantly reduce the frequency of relapses. However, working out the cost-effectiveness of DMTs requires new data on the social, economic and clinical impact of relapses. This includes the frequency and severity of permanent disability after relapse, and the effects of relapses on social functioning. We have started a study to evaluate this, recruiting people with MS when they have had a relapse and following them up over 6-months.

Congratulations and thank you to Nerys Davies, who has MS, and ran a mile a day for the month of May to raise money for MS research in South Wales. She raised over £1300!
https://www.cardiff.ac.uk/news/view/1168429-going-the-distance-for-ms-research

BRAIN Repair & Intracranial Neurotherapeutics
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