ELECTIVE (SSC5a) REPORT (1200 words)

A report that addresses the above four objectives should be written below. Your Elective supervisor will assess this.

Objective 1: Describe the epidemiology of neurodegenerative diseases in the stable island population of Tasmania, and extract lessons for preventive approaches to neurodegeneration

Tasmania is an ideal location to research the epidemiology of neurodegenerative disease. This Australian state has a stable yet ageing population, with 20% of inhabitants being aged over 65 (1). Furthermore, a large proportion of the population live in rural or semi-rural regions. Together, this means that the island is well-placed to test initiatives to improve diagnosis and treatment of neurodegenerative disease in hard-to-reach individuals, and study the risk of disease (2). Dementia rates are increasing in Australia, similarly to other nations with a high human development index (3). For Tasmania specifically, 6300 people had dementia in 2009. In 2024 it is estimated that over 10,000 have dementia in Tasmania, from all causes, while 26,000 are projected to be affected by 2050 (4, 5). Updated figures on prevalence and incidence are needed in Tasmania but it is estimated there are 58 per 100 000 people with Parkinson's disease (PD) in Tasmania (6). While it cannot be ignored that diagnostic methods have improved for dementia, perhaps contributing to this increase, an ascertainment bias is not thought to be a driver of neurodegenerative disease in Tasmania.

The ISLAND Clinic is a novel strategy to address increasing dementia risk in Tasmania. The unique 'one-stop' model of this clinic allows for a morning carousel of neuropsychiatric, medical and research assessments, followed by an afternoon neuroradiological meeting and a diagnosis session between clinician and patient (7). There is also a web-based remote component. Whilst research aspects are optional, this structure of engraining research within a clinical visit lead to high uptake rates, with data for over 400 participants. This structure reduces GP referral to diagnosis time (2).

Lessons can be translated to the work in the East London Parkinson's Disease Project (ELPDP) in underrepresented groups (8). Streamlined remote computerised components, with the possibility of language translation, would shorten clinician visit lengths while addressing some culturo-linguistic barriers to research. ISLAND has prioritised patient experience, making shorter tasks, some with even a game-like component that improves patient engagement. ISLAND has an ingenious integration of research with routine care. Financial barriers to a similar one-stop system in the NHS exist at face value, however may result in cost-saving in the longer-term. However, a possible reason for the success of ISLAND's research uptake is the ability for visits to be consistently useful for patients - unlike ELPDP visits which are purely for research. This idea of bringing tangible benefit for patients during their research interaction is something I wish to understand further.

Objective 2: Describe the structure of Medicare in Australia, comparing and contrasting this to the NHS in the UK.

Pre-arrival in Australia, I expected to see a blend of private and public healthcare. The reality was a system that was mostly free to patients. The healthcare system has similarities to the UK with a mostly accessible healthcare system via Medicare or through an income levy of ~2% if individuals earn over a certain amount. The main group required to pay a large amount are from abroad. Ward-based care was similar, and the on-call consultant system was slightly different in that consultants have up to 6 whole weeks on call throughout the year, unlike 1-3 days on-call common in the UK.

The most striking difference was seen in the secondary care neurology clinics. The Australian consultants and registrars benefitted from a meeting to debrief after the clinic and discuss every single patient seen, enabled by fewer patients per clinic - something time would never allow for in the UK. This has been

shown to reduce the need for follow up and improve patient care, although schedulers in the UK are often understandably inclined to fill every available slot for clinicians, thus preventing such a meeting from occurring.

During my time in Tasmania, I learnt of rare neurological conditions that I have not seen in the UK. Namely, essential tremor induced by a shark attack and >5 cases of Creutzfeldt-Jakob disease in a short period of time. Yet most conditions I saw in neurology are seen frequently in both countries; stroke, PD, AD, multiple sclerosis, and functional neurological disorders (FND).

Objective 3: Evaluate the sensitivity and specificity of an easily administrable visual test in detecting early cognitive impairment in AD and PD, and public health implications for early intervention and prevention.

I was fortunate that my supervisor, A/Professor Jane Alty, was keen for me to engage in research on my elective in Tasmania and was incredibly supportive of me doing so. My project looked at the Cats-and-Dogs (CND) task, previously investigated in PD (9), in the context of detecting early cognitive changes in the ISLAND cohort of older adults. This project has taken shape to compare CND with markers of episodic memory and spatial orientation which are known to be impaired early in AD. My supervisor foresaw that six weeks would be insufficient time to complete the project, so my analysis is pending. However the implications of CND detecting these cognitive measures are that a new visuospatial test may be applicable to AD, while failure to detect these measures may point to the specificity of CND within PD.

This project has taught me much. Firstly, it has been a chance to improve my R coding and analysis skills. Secondly, I gained insight into the ISLAND clinic's structure and principles. The clinical-research visit carousel, and the gait analysis research lab were particularly impressive, and a fantastic example of study design that values its participants. Before seeing the clinic, I wondered what might motivate patients to consent to such a long day of research. Seeing the visits, I saw the real advantages of combining the research with a care provision aspect, enabling a higher chance of research engagement. Having a clinic in a research facility was almost unheard of for me, but patients appeared happy despite some travelling far. This demonstrated to me how research and routine clinical care can be innovatively entwined.

Objective 4: Explore facilitating interinstitutional collaboration, and working in medicine outside of the UK in a well-developed country

I was fortunate that I was able to engage in research work in Tasmania that related to some previous work, and aided collaboration between UTAS, QMUL, and UCL. The Cats-and-Dogs task I have worked with previously at QMUL had been modified at UTAS; in many ways for a better patient experience with fewer stimuli and a more pleasant digital interface system. This helped me realise how my previous work on the task was very adherent to stringent psychophysical rules, at the expense of patient experience. This has informed me to not overlook patient experience in cognitive tests going forward, despite the urge to conform to theoretical dogma.

A challenge of interinstitutional work is different work-paces. In London, research activities tend to always have an aspect of urgency, while in Tasmania the general approach is much more measured and slow-paced. I have quite enjoyed this, and aim to bring back a little of this slower-pace to the UK.

References

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