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Does the truth lie within the gut? Investigating the gut microbiome in an Australian cohort of Parkinson's disease patients

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Parkinson's disease (PD) is associated with an assortment of difficult to recognize non-motor symptoms, including gastrointestinal (GI) dysfunction. Recently, there have been studies reporting the appearance of GI symptoms up to two decades prior to motor symptom onset in patients. To date, limited number of studies have reported an association between an altered microbiota composition and PD. Despite this emerging relationship, it remains to be seen if this association exists in Australian patients with PD. This study involved a multi-centre assessment and recruitment of 120 patients with diagnosed PD from St Vincent's Movement Disorders Clinic (Fitzroy, VIC), the Perron Institute Movement Disorders Clinic (Nedlands, WA). The Movement Disorders Society Unified Parkinson's Disease Rating Scale (MDS-UPDRS) was used to determine disease severity, including motor and non-motor symptoms. Global cognitive function was measure using Addenbrooke's Cognitive Exam-Revised (ACE-R), and Scales for Outcomes in Parkinson's disease Assessment. In collaboration with the Marshall Centre (UWA, WA), this study aimed to determine if the gut microbial composition differed between PD patients and age-matched healthy controls using targeted sequencing of the V3 and V4 regions of 16s ribosomal RNA (rRNA) gene. Microbiome diversity, determined by operational taxonomic units (OTUs) and relative abundance were examined for an association with patient clinical assessment outcomes, using a multivariate regression analysis.

Our current results identified that both relative abundance

and diversity of microbial OTUs were significantly different in patients with PD when compared to healthy controls ($p < 0.05$). Specifically, Verrucomicrobia and Gammaproteobacterial were both increased within PD. Within the patient cohort, reduced microbial diversity was significantly associated with elevated MDS-UPDRS III scores, and decreased quality of life. This project provides the first comprehensive characterisation of the microbial diversity and composition in an Australian cohort of PD patients. The preliminary findings from this study support previous results and show associations between microbial diversity and patient clinical outcomes, further exploring the gut-brain connection in the progression and management of this disease.

Speaker Biography

Jade Kenna is currently in her second year of her PhD in Clinical Neuroscience through the Medical School at The University of Western Australia and The Perron Institute. Her PhD project is the first in Australia to investigate the role of the gut microbiome in a cohort of Parkinson's disease patients from multiple locations around Australia. She has experience presenting oral and poster presentations at national and international conferences. She has been working as a research assistant and laboratory demonstrator alongside completing her PhD and has received Letters from the University's Dean each semester for outstanding teaching performance every semester. In addition, she continues to volunteer for university events and charities, and assists in organizing and operation of many events, such as the inaugural Perron Institute Research Symposium.

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