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Dr Falk/Guts UK Awards 2021

MEDICAL STUDENT PRIZE WINNER: **Aala Mohammed Ali**

PROJECT:
Characterising chronotype, sleep, and circadian disruption in inflammatory bowel disease (IBD).



Miss Aala Mohammed Ali undertook this research at the University of Manchester, Faculty of Biology, Medicine, and Health, whilst intercalating in a MRes in Medical Sciences. She is currently completing her 4th year of medicine at the University of Leeds.

Aala Mohammed Ali explains:

'I have been interested in chronic conditions – including IBD - and the impact that they have on an individual's quality of life since the beginning of clinical medicine. Working with patients to consider and develop new and integrative approaches to improve their experience and journey is something that I feel is a very important part in the management of chronic conditions such as IBD.'

'Inflammatory bowel disease (IBD) is a chronic, relapsing condition of the gastrointestinal tract which affects one in 250 people in the UK, many of whom experience significant decrease in quality of life. Currently, the exact cause of IBD is unknown, however multiple factors have been proposed to be involved in its development including genetic, immunological, and environmental factors. The latter may include smoking, sleep, dietary fibres, and anxiety and depression, factors which have been identified in the literature as both a risk, or a protective factor for the two subtypes of IBD Crohn's disease and ulcerative colitis. Additionally, the chronic nature of IBD has a negative impact on various aspects of a patient's quality of life including sleep, eating, and associated with comorbidities, which can in turn also affect severity of symptoms and wellbeing.'

'The human body works on a 24-hour daily cycle and is run by an internal body system known as the circadian clock which uses environmental cues e.g. food and sunlight, to adjust daily activities. Circadian preferences are characterised into three types; 'morning larks' who are more alert and show greater preference for working during the early hours, 'night owls' who show the opposite preference, and 'intermediate type' who display a flexible preference for working.'

'Research has shown that a 'later' chronotype is associated with greater risks of experiencing severe IBD, possibly caused by disturbances to the circadian process by factors like shift work. Additionally, there is a strong association identified between the immune pathways involved in inflammation and the circadian clock through genetic and rhythmic patterns, which could point to a possible relationship with IBD.'

'The aim of our study is to build on these findings and try to understand in more detail the exact role the circadian mechanism and chronotypes play in the development and presentation of symptoms in patients suffering from IBD.'

An initial pilot study carried out across two hospital trusts within the Greater Manchester area between March-July 2021 found a greater prevalence of 'morning' chronotype amongst the cohort of participants with UC compared to CD, with sleep and eating patterns having the most significant influence on severity and presentation of symptoms in participants with both forms of IBD.

'Our project, which will be conducted within a cohort of up to 3,000 IBD patients across the two sites, will investigate the influence of individual chronotypes and other factors such as mealtime, working patterns, and sleeping on IBD phenotypic severity and susceptibility. This will be conducted primarily through chronotyping patients via a validated questionnaire, identifying shift work patterns, dietary habits, sleeping patterns, IBD severity, and finally analysing the interplay between them.'

'Through exploring this potential relationship between the circadian clock and disease mechanisms of IBD, many areas of disease management can be further understood and improved. For example, applying the method of chronotherapy, which involves matching timing of medication to a person's chronotype preferences, to obtain greater benefits from drug therapies in IBD. Also, a greater understanding on new fields which influence the severity and presentation of IBD can be helpful in developing new management and care pathways, which can be used in both primary and secondary care, to identify at risk individuals and prevent the worsening of IBD and its debilitating chronic symptoms, may be achieved through the findings of this project. Finally, by taking a holistic approach, we hope that this knowledge will aid in the personalisation – and improvement - of individual IBD management. Ultimately, we hope this may lead to influencing on future management of IBD and patient care across the NHS.'

Miss Ali's Project Supervisor John McLaughlin, Professor of Gastroenterology and Nutrition at the University of Manchester comments:

'It was a great pleasure to supervise Aala's MRes project. Aala undertook a combined project of a systematic literature review and a primary research study of patients living with IBD, aiming to characterise their chronotype in relation to their disease. The results show interesting differences to other conditions such as asthma, and some early suggestion of differences between Crohn's disease and ulcerative colitis. As ever, larger studies are now required! Aala was recently awarded her MRes with Distinction, indicating the extremely high quality of her research despite the difficulties imposed by the pandemic. Her dedication and tenacity were commendable. A highly capable academic of the future, I have no doubt she has a bright future in gastroenterology and in research and is fully deserving of the Dr Falk-Guts UK prize in 2021.'

Miss Ali states:

'Being awarded the Guts UK Dr Falk Pharma Medical Student Prize came as a pleasant surprise and a great honour during the intense final stages of my intercalated master's degree. It has been a privilege to learn that this project, which faced some difficulties due to the pandemic, has been considered remotely interesting by a group of professional clinicians and researchers who have been working within the field of IBD and academia for many years.' This award will no doubt support me on my path to becoming a holistic doctor and has enhanced my passion to become more involved in future research opportunities. It has also been a great confidence booster at this early stage of my medical career.'



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