Medical Xpress

New study improves monitoring of treatments for multiple sclerosis patients

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Researchers from the University of Sheffield and Sheffield Teaching Hospitals NHS Foundation Trust have developed an algorithm that, when paired with wearable sensors, provides more informative and effective

monitoring of the way MS patients walk in real life.

The improved monitoring of the way MS patients walk will help clinicians more easily assess the effectiveness of existing treatments and disease progression in MS patients.

The pioneering study, Free-living and laboratory gait characteristics in patients with multiple sclerosis is published today in the journal, *PLOS ONE*.

Assessing the way a person walks (gait) is often used as an indicator in the early stages of MS - a chronic autoimmune inflammatory disease of the central nervous system. Mobility problems affect 75 per cent to 90 per cent of people with MS.

Up until now, gait analysis has only been carried out in laboratories. Doctors at Sheffield Teaching Hospitals approached researchers at the University of Sheffield and asked them to help find a way to measure how patients walk in 'real life' conditions.

Dr Claudia Mazzà, a researcher based at the Insigneo Institute for in silico Medicine at the University of Sheffield, said: "The measurements we take of people with MS in a lab may not be an accurate representation of their everyday condition. Having data from real life scenarios will help clinical staff assess a patient's condition more accurately. For patients this will mean better treatment as a result of clinicians being more informed about their condition.

"We started off by checking that our portable sensor was accurate, comfortable and able to give the same results as a lab based sensor. We then developed an algorithm (computer program) specific to the patient's condition (in this case MS) which processed the measurements taken from this sensor.

"We ensured this algorithm was capable of handling and processing data from complex movements outside labs. Although this is a small study, the results are encouraging and it gives us enough information to progress to a large scale clinical trial."

Dr Sivaraman Nair, Consultant Neurologist at Sheffield Teaching Hospitals, said: "Assessing the changes in the way patients with MS walk is key to understanding the progression of disability. It is particularly important to look at these indicators at an early stage as it can also tell us about the effectiveness of the medication they are taking.

"Currently, mobility of MS patients is assessed in specialised gait laboratories. The relevant technologies can be expensive and require highly skilled personnel. The impact of this research could therefore be significant for patients as well as cost-effective.

"The potential applications of this research are not just limited to MS but could be used for other conditions that could benefit from monitoring gait, such as Parkinson's disease."

The next stage of the research will involve working with the National Institute for Health Research (NIHR) Sheffield Biomedical Research Centre (for Translational Neuroscience) to conduct a larger clinical study.

Innovative Medicine Initiative and pharmaceutical companies are investing €50 million in research linking digital assessment of mobility to clinical endpoints to support regulatory acceptance and clinical practice.

More information: *PLOS ONE* (2018). journals.plos.org/plosone/arti… journal.pone.0196463

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