Potential new test for early diagnosis of osteoarthritis identified

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Researchers at King's College London's Department of Twin Research and Genetic Epidemiology, based at St Thomas' Hospital have discovered new ways of measuring biological markers in the blood which could be used to diagnose osteoarthritis earlier.

Osteoarthritis is a condition that affects the joints and is the most common type of arthritis in the UK. It mostly occurs in the knees, hips and small joints of the hands, but almost any joint can be affected.

The new biochemical test called metabolomics allows the scientists to test for 163 chemical signals at the same time from a single blood sample. These chemical signals are intermediate products of the metabolism of human cells and their 26,000 metabolite ratios represent the rate of the chemical reactions in the human body.

The team first studied 123 white women with osteoarthritis of the knee and 299 healthy women from the Twins UK register, comparing the difference in the metabolites and the 26,000 metabolite ratios between the two groups. They found that 14 metabolite ratios were significantly associated with osteoarthritis. The team then tested these signals to see if they were replicated in an independent sample consisting of 76 women with knee arthritis and 100 healthy women. Two ratios - valine to histidine and xleucine to histidine - were successfully confirmed in the replication sample.

Dr Guangju Zhai, lead author on the paper published in the journal,

Annals of Rheumatic Diseases, said: "Osteoarthritis affects an estimated 8.5 million people in the UK and one of its main characteristics is damage to cartilage, the strong smooth muscle that lines the bones and allows joints to move easily and without friction. The search for biomarkers, or traits, which can be used to measure or indicate the effects or progress of a condition is a hugely exciting area of clinical research. The two novel metabolic biomarkers found through our study could indicate increased cartilage breakdown and we now want to study these mechanisms in more detail."

Professor Tim Spector, senior author of the paper added: "Ours is the first study using a metabolomics approach to identify novel metabolic biomarkers for osteoarthritis. We hope that further research will lead to these two metabolite ratios being adopted into clinical practice, enabling doctors to diagnose the condition, or identify that osteoarthritis is developing, earlier. Our study also shows the enormous clinical potential of metabolomics, and we hope in future that they could be used to monitor the effectiveness of treatments. At the moment we relay on x-rays and scans - and our dependence on these methods is a major obstacle to the development of new drugs for osteoarthritis."

Research studies such as this underpin King's Health Partners Academic Health Sciences Centre, a pioneering collaboration between King's College London, and Guy's and St Thomas', King's College Hospital and South London and Maudsley NHS Foundation Trusts which aims to deliver medical breakthroughs to patients at the earliest opportunity.

Provided by King's College London

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