

Researchers use Botox-like injection to treat runners and cyclists with knee pain

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A painful knee condition that affects more than one in eight active people has been treated effectively with a botulinum toxin injection and physiotherapy.

Researchers from Imperial College London and Fortius Clinic carried out a trial involving 45 [patients](#) with what they term lateral patellofemoral overload syndrome. Sufferers, often runners and cyclists, experience pain in the front and side of the knee joint.

The trial involved an injection of Dysport, which like Botox is a type of [botulinum toxin](#), into a muscle under ultrasound guidance, at the front and outside of the hip, followed by personalised physiotherapy sessions.

Sixty nine per cent of patients required no further medical interventions, and had complete pain relief when followed up five years later. Previous studies have shown that 80 per cent of patients reported experiencing ongoing symptoms after conventional treatment, with 74 per cent experiencing reduced activity levels.

Lateral patellofemoral overload syndrome (LPOS) affects professional and amateur runners and cyclists as well as active people generally. Symptoms include inflammation and a sharp localised pain, which prevents athletes from continuing their activity, taking them several days to recover. Alternatively, athletes suffer inflammation and a progressive build-up of [knee pain](#), which worsens after a sporting activity, taking them many days to improve.

The team estimate that one in five active females and one in eight active males have these symptoms. Active people are those who participate in sport - whether at an amateur or professional level. Current methods for treating patients include physiotherapy, the use of anti-inflammatories, steroid injections and if these methods fail, surgery. Even after such treatments, the majority of patients report persistent pain and reduced activity levels.

Physiotherapist Dr Jo Stephen, co-author of the study from the Department of Mechanical Engineering at Imperial College London and Fortius, said: "As a physiotherapist it can be incredibly frustrating to run out of treatment options for patients with this painful condition. Many athletes who took part in this study had exhausted all other treatment options and this was their last resort. We are really excited that our approach is showing positive results for patients, which could have implications for active people around the world."

Sam Church, co-author and consultant knee surgeon from Fortius Clinic, said: "This research is a really exciting step forward in the management of a very common cause of knee pain in athletes. Our results show that botulinum toxin can provide better and longer lasting pain relief than the current, conventional alternatives."

The team had previously noted that patients with LPOS symptoms overused their tensor fascia lata muscle in the hip, instead of the gluteal muscles in the buttocks. They suspected that this was the reason why physiotherapy treatment often did not help patients to strengthen their buttocks, as the tensor fascia lata muscle was over-compensating when they were doing the supposed strengthening exercises.

In the study, the team first showed that using physiotherapy alone on patients failed to alleviate their pain. The patients then had an injection of Dysport into the front hip muscle, helping it to relax so that the

buttock muscles had to be used more. Patients followed the injection with further physiotherapy to strengthen their buttocks muscles and address other weak or tight muscles as appropriate.

David Urquhart, co-author from Chelsea and Westminster Hospital, added: "Patients travelled from all over the country to take part in this study, which is an indication of their eagerness to find a solution to their discomfort. All had longstanding [pain](#) that had failed to respond to physiotherapy and conventional treatment. Our findings show botulinum toxin has revolutionised the treatment of these patients."

One of the current limitations with the study, say the team, is that they have not yet directly measured hip muscle activity, but engineers from Imperial have run a computational model to support their theory. The next step will see the team analysing muscle activity pre and post Dysport injections, with further computational analysis to explore the mechanisms at work.

The study is published today in the *American Journal of Sports Medicine*.

Provided by Imperial College London

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