

Illusion can halve the pain of osteoarthritis, scientists say (w/ video)

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(PhysOrg.com) -- A serendipitous discovery by academics at The University of Nottingham has shown that a simple illusion can significantly reduce -- and in some cases even temporarily eradicate -- arthritic pain in the hand.

By tricking the brain into believing that the painful part of the hand is being stretched or shrunk, the researchers were able to halve the pain felt by 85 per cent of sufferers they tested.

The research could point to new technologies of the future which could assist patients in improving mobility in their hand by reducing the amount of pain they experience while undergoing physiotherapy.

The Nottingham team stumbled on its finding completely by chance during the University's Community Open Day in April last year.

As part of the event they invited members of the public to experience some of the body distortion illusions they use as part of their every day research using Nottingham's unique MIRAGE technology — which takes a real-time video capture image of a hand and uses computer manipulations combined with physically pulling or pushing on the hand to fool the brain into believing the hand is stretching or shrinking.

Up until now, the technology has been used for fundamental research into body representation — the way in which our brain puts together what we see and what we feel.

Dr Roger Newport who is leading the research in the School of Psychology said: “The majority of people who come to these fun events are kids — the illusions really capture their imagination and they think it’s a cool trick and can become a bit obsessed with working out how we do it.”

Dr. Catherine Preston, who is now at Nottingham Trent University and collaborated on the study, added: “During the course of the day the grandmother of one of the children wanted to have a go, but warned us to be gentle because of the arthritis in her fingers. We were giving her a practical demonstration of illusory finger stretching when she announced: “My finger doesn’t hurt any more!” and asked whether she could take the machine home with her! We were just stunned — I don’t know who was more surprised, her or us!”

To capitalise on their lucky discovery, the team immediately contacted a local osteoarthritis support group and asked them to take part in a series of tests to confirm the effectiveness of MIRAGE for pain relief.

The study attracted 20 volunteers with an average age of 70, all clinically-diagnosed with arthritic pain in the hands and/or fingers and none medically managing their pain on the day by anything stronger than paracetamol. Before starting the test they were asked to rate their pain on a 21-point scale, with 0 indicating no pain and 20 representing the most unbearable pain imaginable.

The team then compared the MIRAGE body [illusion](#) to just physically pushing and pulling on the painful parts of the volunteers’ hands to test the effect on their pain. Other control tests were conducted by stretching or shrinking a non-painful part of the hand and visually enlarging or reducing the whole hand.

The results, reported in a letter to the latest edition of the journal

Rheumatology, showed a marked reduction in pain —on average halving the discomfort for 85 per cent of volunteers. Some reported greater reduction in pain for stretching, some for shrinking and some for both. The pain reduction only worked when painful parts of the hand were manipulated.

Remarkably, stretching or shrinking the painful part of the hand temporarily eliminated pain in one-third of all volunteers. Anecdotally, many volunteers also reported an increased range of movement.

Osteoarthritis is a debilitating and painful inflammatory condition which affects the joints and is one of the most common arthritic conditions. Around one million people consult their GPs about OA every year — mostly people aged over 50 who are more prone to developing the disease.

There is currently no cure for osteoarthritis but the symptoms can be managed by a range of treatments including painkillers and physiotherapy — although pain can be a barrier to sufferers trying to exercise and keep joints mobile.

The Nottingham team are hopeful their finding could be the first step towards new technologies for physiotherapy, allowing health professionals to reduce the pain for sufferers while exercising their joints. Eventually, cheaper technology may allow a low-cost model of the system to be produced which could be small enough for sufferers to keep in their home and offering brief periods of respite from their discomfort.

Dr Newport stressed that the work is at a very early stage and that further studies would be needed to further assess the effectiveness of the technology in pain reduction and to this end the researchers have recently been successful in securing a £23,000 Serendipity Grant from

the Dunhill Medical Trust. There is also further potential for collaboration with colleagues at the Arthritis UK Pain Centre at The University of Nottingham to study the [brain](#)'s role in mediating [pain](#) in arthritis.

Dr Newport added: "This research is an excellent example of how fundamental research can often produce unexpected and significant results. In my early career I was lucky enough to receive internal funding to develop the MIRAGE technology which is unique to The University of Nottingham."

"Without that support we never would have unearthed this surprising and exciting result, which potentially could be extremely important to the millions of people who suffer from this painful and debilitating illness."

Provided by University of Nottingham

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