

Plasma Treatment Shows Potential For Knee Pain

A study by researchers from Hospital for Special Surgery has shown that platelet-rich plasma (PRP) holds great promise for treating patients with knee osteoarthritis. The treatment improved pain and function, and in up to 73 percent of patients, appeared to delay the progression of osteoarthritis, which is a progressive disease. The study appears online, ahead of print, in the *Clinical Journal of Sports Medicine*. "This is a very positive study," said Brian Halpern, M.D., chief of the Primary Care Sports Medicine Service at Hospital for Special Surgery, New York City, and lead author of the study.

Several treatments for osteoarthritis exist, including exercise, weight control, bracing, non-steroidal anti-inflammatories, Tylenol, cortisone shots and viscosupplementation, a procedure that involves injecting a gel-like substance into the knee to supplement the natural lubricant in the joint. A new treatment that is being studied by a small number of doctors is PRP injections. PRP, which is produced from a patient's own blood, delivers a high concentration of growth factors to arthritic cartilage that can potentially enhance healing.

"You take a person's blood, you spin it down, you concentrate the platelets, and you inject a person's knee with their own platelets in a concentrated form," said Dr. Halpern. "This then activates growth factors and stem cells to help repair the tissue, if possible, calm osteoarthritic symptoms and decrease inflammation."

In the new study, researchers enrolled patients with early osteoarthritis, gave them each an injection of PRP (6 mL), and then monitored them for one year. Fifteen patients underwent clinical assessments at baseline, one week, and one, three six, and 12 months. At these time points, clinicians used validated tools to assess overall knee pain, stiffness and function, as well as a patient's ability to perform various activities of daily living. At baseline and then one year after the PRP injection, physicians also evaluated the knee cartilage with magnetic resonance imaging (MRI), something that has not previously been done by researchers in other PRP studies. The radiologists reading the MRIs did not know whether the examination was performed before or after the PRP treatment.

"The problem with a lot of the PRP studies is that most people have just used subjective outcome instruments, such as pain and function scores," said Hollis Potter, M.D., chief of the Division of Magnetic Resonance Imaging at Hospital for Special Surgery, another author of the study. "But even when patients are blinded, they know there has been some treatment, so there is often some bias interjected into those types of studies. When you add MRI assessment, it shows you the status of the disease at that time, regardless of whether the patient is symptomatic or asymptomatic or they have good or poor function in the knee. You find out what the cartilage actually looks like. We can non-invasively assess the matrix or the building blocks of cartilage."

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While previous studies have shown that patients with osteoarthritis can lose roughly five percent of knee cartilage per year, the HSS investigators found that a large majority of patients in their study had no further cartilage loss. "The knee can be divided into three compartments, the medial compartment, the lateral compartment and the patellofemoral compartment," said Dr. Halpern. "If we look at these compartments individually, which we did, in at least 73 percent of these cases, there was no progression of arthritis per compartment at one year. That is very significant, because longitudinal studies suggest a four to six percent progression of arthritis at one year."

Treatment with PRP was also useful in improving pain, stiffness and function. The investigators found that pain, measured by a standard test called the Western Ontario and McMaster Universities Arthritis Index, significantly improved with a reduction of 41.7 percent at six months and 55.9 percent at one year. On a pain scale commonly used by clinicians called the Visual Analog Scale, pain was reduced by 56.2 percent at six months and 58.9 percent at one year. Functional scores improved by 24.3 percent at one year. Activity of Daily Living Scores also showed a significant increase at both six months (46.8 percent) and one year (55.7 percent).

"We are entering into an era of biologic treatment, which is incredibly ideal, where you can use your own cells to try to help repair your other cells, rather than using a substance that is artificial," Dr. Halpern said. "The downside is next to zero and the upside is huge." Dr. Halpern pointed out, however, that the study is a small case series and PRP needs to be pitted against a traditionally treated group in a randomized, controlled trial.

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