

# Patient's own fat cells transplanted to treat osteoarthritis found may be effective

April 16 2015

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Osteoarthritis (OA), a debilitating and painful degenerative disease, strikes an estimated 14 percent of adults 25 years of age and older, a third of adults age 65 and older in the U.S. alone. Those who suffer from OA may one day have a new and effective cell therapy, thanks to a team of Czech researchers who studied the effectiveness of using an OA patient's own adipose (fat) cells in a unique transplant therapy aimed at reducing the symptoms of this prevalent and difficult to treat condition as well as healing some of the damage caused by OA.

The Investigational Review Board of American Naturopathic Research Institute/Naturopathic Oncology Research Institute and local ethics committees-approved study, carried out with 1,114 OA volunteer patients who received autologous (self-donated) fat cell transplants after giving their informed consent, saw their symptoms improved by the therapy. The paper describing the study will be published in a future issue of *Cell Transplantation*.

"Adipose-derived [cells](#) have potential application in a wide range of clinical disorders, including myocardial infarction, stroke, Crohn's disease, multiple sclerosis (MS), rheumatoid arthritis, and breast augmentation and reconstruction" said Dr. Jaroslav Michalek, of the International Consortium for Cell Therapy and Immunotherapy, and a member of a research team from a number of research facilities and organizations in the Czech Republic. "In this study we evaluated the safety and efficacy of freshly isolated autologous stromal vascular fraction cells (SVF cells). We hypothesized that the SVF cell treatment

might contribute to cartilage healing."

Dr. Michalek and his colleagues clarified the use of the term SVF cells by noting that many scientific publications use the term [adipose tissue](#) as the source of [adipose cells](#), but that the true source of SVF cells is not adipose but the stroma, the loose connective tissue part of the fat typically obtained by liposuction.

The study followed and evaluated 1,114 patients (median age 62, range 19-94 years; 52.8% male) treated with a single dose of SVF cells isolated from lipoaspirate by a patent pending kit (Cellthera). Patients were followed for between 12 and 54 months with a median of 17.2 months of follow-up. Their evaluations were based on pain, non-steroid analgesic usage, limping, extent of joint movement and stiffness before treatment and at three, six, and 12 months. Hip and knee joints were the most common joints treated and some patients had more than one joint treated.

"No serious side effects, systemic infection or cancer was associated with SVF cell therapy," reported the researchers. "Most patients improved gradually three to 12 months after treatment."

The evaluations demonstrated that at least a 75 percent score improvement was noticed in 63 percent of the patients and at least a 50 percent score improvement was documented in 91 percent of the patients after 12 months, said the researchers. Typically patients in the study consumed large amounts of painkillers for their symptoms. Researchers found that painkiller usage declined dramatically after treatment.

"Obesity and a higher grade of OA were associated with slower healing," said Dr. Michalek.

The researchers noted that there are many advantages to using SVF cells over using bone-marrow derived mesenchymal stem cells (MSCs) to treat OA.

- Adipose tissues are easily obtained through liposuction.
- They are plentiful and contain approximately a 500-2,500 times higher amount of MSCs than that can be derived from bone marrow.
- MSCs in bone marrow dramatically decrease with age; the pool of adipose tissue is quite stable over a lifetime.
- Adipose tissues contain unique cells that suppress inflammatory responses.
- They do not require in vitro cultivation.
- SVF cells are ready for immediate use after isolation from adipose tissues.
- SVF therapy has no serious side effects.

The SVF cell therapy also has advantages over several other OA therapies, said the researchers. For example, treating OA with total joint (replacement) arthroplasty (TJA) may not be feasible for some because of their advanced age or general health status. TJA has also been associated with considerable side effects, including myocardial infarction, stroke, systemic infections and death.

"Autologous stromal vascular fraction cell therapy for degenerative osteoarthritis is safe, cost effective and clinically effective, and can lead to an improved quality of life," concluded the researchers. "However, there is no guarantee that this cell therapy can lead to a definite cure for degenerative OA. Future patients receiving SVF will need longer follow-up to answer questions about durability and long term safety of SVF cell therapy."

"Use of the stromal vascular fraction has recently gained attention for

being more effective in ameliorating symptoms of various diseases than adipose-derived stem cells alone," said Dr. David Eve, of the Department of Neurosurgery and Brain Repair at the University of South Florida and associate editor of *Cell Transplantation*. "The large sample size of this study is commendable and further demonstration of the effectiveness and safety of this cell therapy could be achieved with longer follow-up and further exploration of the mode of action."

**More information:** Autologous adipose tissue-derived stromal vascular fraction cells application in patients with osteoarthritis, [ingentaconnect.com/content/cog... -1300 Michalek et al](https://ingentaconnect.com/content/cog...-1300_Michalek_et_al)

Provided by Cell Transplantation Center of Excellence for Aging and Brain Repair

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