

Swiss researchers evaluate fetal progenitor tenocytes for repairing tendon injuries

August 20 2015

Tendon injuries, especially those acquired while engaging in sports, are not easily healed due to the fibrous nature of tendon tissues which transmit forces from muscle to bone and protect surrounding tissues against tension and compression. Tendon injuries to wrists, knees, elbows and rotator cuffs, often from over use when playing golf or tennis, are increasingly common for both professional and amateur athletes ("weekend warriors") alike.

Previous studies in which human fetal progenitor tenocyte (hFPT) transplantation stimulated regeneration of tendons and expedited the healing process served as the impetus for a recent study conducted by a team of Swiss researchers who characterized hFPTs and evaluated their therapeutic potential.

Their study will be published in a future issue of *Cell Transplantation* and is currently freely available on-line as an unedited early e-pub.

"Tendon healing is always a long process," said study co-author Dr. Lee Ann Laurent-Applegate of the University Hospital of Lausanne's Department of Musculoskeletal Medicine, Switzerland. "The healing process is not perfect and the natural structure is often never attained again. The scar tissue and adhesions remain and can lead to decreased mobility and rupture."

The researchers noted that because of poor healing outcomes, new strategies in regenerative therapy are needed.

Their study reviewed previous laboratory and clinical studies in which fetal [progenitor cells](#) were used. One such study found positive results when children suffering from burns were treated with biological bandages comprised of fetal skin progenitor cells.

The current study involved developing the optimal culturing and storage procedures for hFPTs so that they can be used for tendon regeneration.

"In order for this procedure to become a viable treatment option, it is crucial to be in accordance with laws and regulations," wrote the researchers. "Tissues and cells for clinical use are stringently regulated in most countries worldwide. In the present study, the tissue was obtained as an organ donation which is registered with Swissmedic (Swiss Agency for Therapeutic Products) in a Federal Transplantation Program and its use was in accordance with the Law for Transplantation RS810.21 of Switzerland and its related directives on research with human subjects."

According to the researchers, their co-culture model demonstrated that hFPTs could stimulate adult tenocytes and that an increase in their activity could potentially accelerate the regenerative process. In addition, previous studies have indicated that transplanted hFPTs could potentially provide healing without scars with the absence of fibrotic tissue. An in vivo study to show safety and efficacy would be the next step to bring this cell therapy closer to the clinic, they concluded.

"The ability of hFPTs to stimulate the activity of adult tenocytes is of importance as it could lead to a more rapid [healing process](#)," said the authors. "The in vivo model chosen for further evaluation should also allow researchers to determine whether rapid regenerative healing without scarring could be attained, while assuring safety and that no immune reaction would be elicited by these particular banked fetal progenitor tenocytes."

"The data from this study propose that not only do fetal tenocytes proliferate more rapidly than their adult counterpart, but they are also able to induce increased metabolic activity in mature cells," said Dr. Maria Carolina de Oliveira Rodrigues of the University of São Paulo, Brazil and section editor for *Cell Transplantation*. "In addition, it was shown that hFPTs maintained their phenotype even under osteogenic and adipogenic culture conditions-a tribute to their stability. While the study elucidates characteristics germane to the use of these cells for therapeutic purposes, in vivo studies are imperative for assessment of safety and efficacy, while also addressing potential ethical concerns."

More information: Grognez, A; Scaletta, C.; Farron, A.; Raffoul, W.; Applegate, L. A. Human Fetal Progenitor Tenocytes for Regenerative Medicine. *Cell Transplant*. Appeared or available on-line: June 24, 2015. http://ingentaconnect.com/content/cog/ct/pre-prints/content-CT-1447_Grognez_et_al

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

Citation: Swiss researchers evaluate fetal progenitor tenocytes for repairing tendon injuries (2015, August 20) retrieved 10 April 2024 from <https://medicalxpress.com/news/2015-08-swiss-fetal-progenitor-tenocytes-tendon.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--