Clinical trial shows ability of stem cell-based topical solution to regrow hair

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A more enriched adipose-derived stem cells-constituent extract (ADSC-CE) with stem cell proteins is obtained by disruption of the ADSC membrane using a low frequency of ultrasound wave. Credit: AlphaMed Press

The results of a clinical trial released today in *STEM CELLS*

Translational Medicine demonstrate how a topical solution made up of stem cells leads to the regrowth of hair for people with a common type of baldness.

Androgenetic alopecia (AGA) - commonly known as male-pattern baldness (female-pattern baldness in women)—is a condition caused by genetic, hormonal and environmental factors. It affects an estimated 50 percent of all men and almost as many women older than 50. While it is not a life-threatening condition, AGA can lower a person's self-esteem and psychological well-being. There are a few FDA-approved medications to treat hair loss, but the most effective can have side effects such as loss of libido and erectile dysfunction. Therefore, the search continues for a safer, effective treatment.

Adipose tissue-derived stem cells (ADSCs) secrete several growth hormones that help cells develop and proliferate. According to laboratory and experimental studies, growth factors such as hepatocyte growth factor (HGF), vascular endothelial growth factor (VEGF), insulin-like growth factor (IGF) and platelet-derived growth factor (PDGF) increase the size of the hair follicle during hair development.

"Recent studies have shown that ADSCs promote hair growth in both men and women with alopecia. However, no randomized, placebo-controlled trial in humans has explored the effects and safety of adipose-derived stem cell constituent extract (ADSC-CE) in AGA. We aimed to assess the efficacy and tolerability of ADSC-CE in middle-aged patients with AGA in our study, hypothesizing that it is an effective and safe treatment agent," said Sang Yeoup Lee, M.D., Ph.D., of the Family Medicine Clinic and Research Institute of Convergence of Biomedical Science and Technology, Pusan National University Yangsan Hospital in South Korea. He led the group of researchers, which also included colleagues from Pusan National University School of Medicine, Pusan National University Yangsan Hospital and T-Stem Co., Ltd.

The team recruited 38 patients (29 men and nine women) with AGA and assigned half to an intervention group that received the ADSC-CE topical solution and half as a control group that received a placebo. Twice daily, each patient applied the ADSC-CE topical solution or placebo to their scalp using their fingers.

"At the end of 16 weeks, the group that received the ADSC-CEs had a significant increase in both hair count and follicle diameter," reported the study's senior author, Young Jin Tak, M.D., Ph.D.

Dr. Lee added, "Our findings suggest that the application of the ADSC-CE topical solution has enormous potential as an alternative therapeutic strategy for hair regrowth in patients with AGA, by increasing both hair density and thickness while maintaining adequate treatment safety. The next step should be to conduct similar studies with large and diverse populations in order to confirm the beneficial effects of ADSC-CE on hair growth and elucidate the mechanisms responsible for the action of ADSC-CE in humans."

"For the millions of people who suffer from male-pattern baldness, this small clinical trial offers hope of a future treatment for hair regrowth," said Anthony Atala, M.D., Editor-in-Chief of *STEM CELLS Translational Medicine* and director of the Wake Forest Institute for Regenerative Medicine. "The topical solution created from proteins secreted by stem cells found in fat tissue proves to be both safe and effective. We look forward to further findings that support this work."

More information: Young Jin Tak et al, A randomized, double-blind, vehicle-controlled clinical study of hair regeneration using adipose-derived stem cell constituent extract in androgenetic alopecia, *STEM CELLS Translational Medicine* (2020). DOI: 10.1002/sctm.19-0410

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