

Mesenchymal stem cell exosomes offer hope in healing chronic wounds

Published on August 19, 2015 at 4:47 AM

Chronic non-healing wounds, common in patients with diabetes and paraplegia, affect over 6.5 million people annually and cost an estimated \$25 billion a year in treatment alone in the United States.

Offering new hope, is a study led by Evangelos Van Badiavas MD PhD, Professor of Dermatology and Cutaneous Surgery and a Principal Investigator at the Interdisciplinary Stem Cell Institute at the University of Miami Miller School of Medicine. Dr. Badiavas' research demonstrates how mesenchymal stem cell (MSC) exosomes, cell-derived vesicles that exist in biological fluids, function to repair non-healing wounds. This study, titled '*Mesenchymal Stem Cell Exosomes Induce the Proliferation and Migration of Normal and Chronic Wound Fibroblasts, and Enhance Angiogenesis In Vitro*', was published in *Stem Cells and Development*.

Dr. Badiavas said:

Many chronic wounds are unresponsive to existing treatments. While past studies have demonstrated that MSCs were capable of healing chronic wounds, the exact mechanisms of wound healing mediated by MSCs have been unclear. Understanding the role of MSC exosomes in repairing wounds is a step towards developing more effective treatment options."

For this study, fibroblasts were isolated from the edge of a non healing wound in a 59-year-old male with uncontrolled diabetes. His ulcer had not healed for over two years despite standard of care and advanced wound care treatments.

The team at ISCI found that introducing MSC exosomes could enhance the growth and migration of normal and chronic wound fibroblasts, and induce the development of new blood vessels in vitro. Also important in wound healing is that MSC exosomes appear to induce changes by activation of growth factor signalling cascades.

"This study improves our understanding of MSCs and their many functions," says Joshua M. Hare, MD, Director of the Interdisciplinary Stem Cell Institute at the University of Miami Miller School of Medicine. "In the future, exosomes derived from MSCs could be used for wound healing as a safe and effective "off the shelf" product. These findings are very exciting and suggest a possible addition to the armamentarium of regenerative medicine."

Source:

Interdisciplinary Stem Cell Institute
