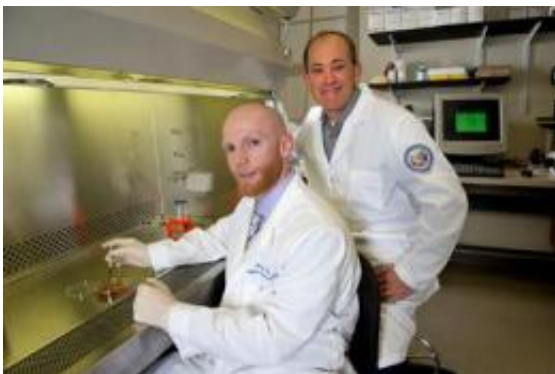


Researchers work with platelet-rich plasma to heal chronic wounds in veterans

November 10 2011, By Sathya Achia Abraham



Scott A. Sell, Ph.D., and his mentor Jeffery J. Ericksen, M.D.

(Medical Xpress) -- During the conflicts in Iraq and Afghanistan, blast injuries resulting from improvised explosive devices, or IEDs, and roadsides bombs took countless lives and left thousands of soldiers who managed to survive with devastating injuries.

Many of these troops experienced polytrauma injuries including [spinal cord](#) injuries and traumatic brain injuries, loss of limbs, damage to various organs, internal injuries, [orthopedic injuries](#) and a whole gamut of dermal injuries.

Immobile patients – particularly those with spinal cord injuries – are at risk of developing chronic pressure ulcers. These non-healing wounds are a cause of distress for patients and their caregivers, and costly to

treat.

Working to stimulate healing and promote tissue repair of chronic pressure ulcers are Scott A. Sell, Ph.D., a polytrauma research fellow at the Hunter Holmes McGuire VA Medical Center with an affiliate appointment in the VCU School of Engineering's Department of Biomedical Engineering, and his mentor Jeffery J. Ericksen, M.D., associate professor in the VCU Department of Physical Medicine and Rehabilitation, who is also affiliated with the Hunter Holmes McGuire VA Medical Center.

Sell's work centers on tissue engineering – a field that combines cells and scaffold to aid in the restoration or replacement of tissue/organ function.

“We noticed that many of these vets with polytrauma brain injuries and spinal cord injuries had large tissue defects - some have large muscle mass and/or tissue missing, many are paralyzed to varying degrees, and these injuries lead to pressure ulcers,” said Sell.

“These wounds are chronically inflamed and never heal. So we were trying to come up with bedside tissue regeneration approaches to stimulate these wounds to close up and heal and build some sort of tissue there,” he said.

Sell first became interested in tissue engineering while doing research in the lab of Gary L. Bowlin, Ph.D., professor of biomedical engineering in the VCU School of Engineering and director of the Tissue Engineering Laboratory at VCU. From there, Sell took his knowledge of ligament regeneration and began looking at regenerative and tissue engineering approaches to treat polytrauma and work with a multidisciplinary team at the Richmond VA.

“Once I got to the VA and could see first-hand the clinical applications

of [tissue engineering](#), it was really eye opening. Just to see a lot of the large tissue defects the vets have to deal with and pain they endure – I knew I had to branch off into tissue and dermal engineering,” he said.

Advancing PRP to treat chronic pressure ulcers

Sell and Ericksen have been able to use a method known as platelet-rich plasma therapy, or PRP, at the patient’s bedside where they draw a patient’s blood and spin in a centrifuge to make a platelet-rich plasma and then inject it back into the wound site to accelerate the healing in pressure ulcers that are not responding to conventional treatment.

While the method has been used in the clinic – for example, the PRP injections Hines Ward had before the Super Bowl in 2009 for his ligament sprain – Sell and Ericksen have taken the work one step further to develop a sustained release method for delivering PRP growth factors and cytokines.

According to Sell, they used a liquid PRP for immediate stimulation, and alginate beads containing PRP as a delivery vehicle for the sustained release of PRP-derived growth factors into pressure ulcers that no longer respond to conventional treatment. Alginate is a biomaterial derived from seaweed or algae that is known to be biocompatible. It is commonly used as a wound dressing in the treatment of pressure ulcers.

In a small case study published this year in *The Journal of Spinal Cord Medicine*, the VCU team reported that the sustained release of growth factors from PRP therapy positively stimulated healing in chronic pressure ulcers in three veterans with spinal cord injuries.

The team has plans to soon conduct a large-scale clinical trial to further understand the role of PRP therapy to treat chronic pressure ulcers in patients with [spinal cord injuries](#).

“While our preliminary work has been very promising in treating these chronic wounds, we hope to start a large-scale trial in the near future to really demonstrate the healing potential of the PRP,” said Sell.

“Going forward, it is possible that PRP, particularly with a sustained release component, will not only be effective in treating chronic [pressure ulcers](#), but could also be beneficial in jump-starting the healing process in the wide array of physical injuries that are typically seen in our veteran patients,” he said.

Provided by Virginia Commonwealth University

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