Experimental approach may improve healing of diabetic wounds and bed sores

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Loyola University Health System researchers are reporting on a promising new approach to treating diabetic wounds, bed sores, chronic ulcers and other slow-to-heal wounds.

It may be possible to speed healing by suppressing certain immune system cells, researchers wrote in the February, 2011, issue of the journal *Expert Review of Dermatology*.

The cells are called neutrophils and natural killer T (NKT) cells. These white blood cells act to kill bacteria and other germs that can infect wounds. NKT cells also recruit other white blood cells to the site of injury. But in some cases, these NKT cells can do more harm than good, said senior author Elizabeth Kovacs, PhD, director of research in Loyola's Burn & Shock Trauma Institute.

Neutrophils can be beneficial to wound healing by gobbling up harmful bacteria and debris such as dead cells. But neutrophils also can do harm -- by producing enzymes that digest healthy surrounding tissue, leading to excessive scar tissue and slower healing.

"It's a balancing act. You need neutrophils, but not too many of them," said Aleah Brubaker, first author of the article and an MD/PhD student at Loyola University Chicago Stritch School of Medicine. The third co-author is Dr. David Schneider, a surgical resident at Loyola.

NKT cells respond to wound injuries by producing proteins called

cytokines and chemokines that attract neutrophils and other white blood cells to the wound site. A previous study at Loyola demonstrated that the presence of activated NKT cells slows down the healing process, while the absence of these cells leads to faster wound closure.

In an editorial, Kovacs and colleagues wrote that since neutrophils and NKT cells are among the earliest immune system responders to injury, "they serve as ideal targets for modulation of the wound-repair process." For example, in experimental models, treatment with antibodies against surface molecules on neutrophils or NKT cells can inactivate the cells or prevent them from entering the wound.

Early treatment in high-risk patients using such therapeutic strategies may be able to "decrease the incidence and prevalence of chronic, non-healing wounds, reduce infectious complications and ameliorate associated healthcare costs," Kovacs and colleagues wrote.

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