

# Factors ID'd in healing failure of diabetic foot ulcers

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(HealthDay) -- Patients with diabetes whose foot ulcers fail to heal have increased inflammation and aberrant growth factor levels, according to a study published online June 11 in *Diabetes*.

Thanh Dinh, D.P.M., from the Beth Israel Deaconess Medical Center in Boston, and colleagues followed 104 patients with type 1 or 2 diabetes and 36 healthy controls to investigate whether vascular function and inflammation play a role in the development and healing of [diabetic foot ulcers](#).

The researchers found that, after a mean of 18.4 months, 30 patients with diabetes (29 percent) developed foot ulcers. These patients had more severe neuropathy, a higher white [blood cell count](#), and reduced vasodilation. Ulcers failed to heal in 47 percent of these patients. Compared with those who healed, these patients had higher serum levels of tumor necrosis factor-alpha, monocyte chemoattractant protein-1, matrix metalloproteinase 9 (MMP-9), and fibroblast growth factor 2. Compared with skin samples from control patients, patients with diabetes had greater immune cell infiltration, MMP-9 expression, and protein tyrosine phosphatase-1B (PTP1B).

"We conclude that increased inflammation, expression of MMP-9, PTP1B, and aberrant growth factor levels are the main factors associated with failure to heal diabetic foot ulcers," Dinh and colleagues write.

**More information:** [Abstract](#)

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